NetworkWorld
THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

NetworkWorld TECHNICAL SEMINARS

# VPN'98℠

# Building and Managing the Extended Enterprise

Presented by
**Andrew Hacker**
*The Tolly Group*

## TOUR DATES & LOCATIONS

| | | | |
|---|---|---|---|
| September 23 | Chicago, IL | November 10 | Washington, DC |
| September 24 | Dallas, TX | November 11 | Atlanta, GA |
| October 13 | Los Angeles, CA | December 1 | New York, NY |
| October 14 | San Francisco, CA | December 2 | Boston, MA |

## PROGRAM OVERVIEW

Virtual Private Networks (VPNs) promise to build and extend your corporate network by leveraging the global reach of the Internet. In fact, according to the 1998 Network World 500 study, 58% of network managers are seriously considering deploying a VPN in the next 12 months. Vendors are rushing to incorporate this technology into products ranging from routers to firewalls to remote access servers. In addition to VPN products from networking vendors, many carriers, ISPs, and value-added network providers will offer fully managed VPN services. Users wonder what's involved in deploying and managing VPNs, and how VPNs will integrate with current network operations.

**VPN '98** will help you determine the benefits and risks of VPNs by exploring all aspects of this technology and how it stacks up against more private alternatives such as frame relay and leased line solutions. This seminar, taught by Andrew Hacker, a VPN expert with The Tolly Group, will address everything from VPN fundamentals and security issues, to class of service and performance.

Get the hard facts you need to embrace VPN technology, identify how product and service offerings meet your needs, and make VPNs work for you. Register today to attend VPN '98.

## BENEFITS OF ATTENDING

Understand the various architectural approaches to Virtual Private Networks

Learn how VPNs implement secure protocols and encryption standards such as the IETF's emerging IP Security (IPSec), Data Encryption Standard (DES), Triple DES, and Layer 2 Tunneling Protocol (L2TP)

Compare and contrast VPN performance with what you've come to expect from existing private networks

Ensure that VPN products offer support for your network platforms and protocols

Understand appropriate applications for VPN

Discover how VPNs can provide guaranteed service levels

Explore the issues of implementing and managing VPN technology and its impact on your IS budget

Learn the benefits and tradeoffs of VPNs versus alternatives such as frame relay and leased lines

Understand the role of ISPs, carriers, and value-added network providers

Speak with VPN vendor representatives to address your specific needs

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# VPN '98 Showcase

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# Seminar Outline

## INTRODUCTION

Keeping up with an emerging technology can be difficult. VPN functionality is being offered by a large number of companies in a wide range of products. This section describes VPN basics and the VPN market today including what kind of companies and products offer which VPN services.

- What Is a VPN?
- Why Use VPNs?
  - Driving Factors
  - Business and Network Evolution
- What Are the Elements of a VPN?
  - Overview of VPN Product Types
  - Underlying Network Infrastructure
- Comparing VPNs and Alternatives
  - Frame Relay
  - Leased Line
  - ATM

## VPN CONCEPTS AND DESIGN

There is a wide range of VPN implementations available today. Learn the various VPN architectures and compare the secure protocols that make VPNs possible.

### VPN Architectures

- Where Can You Find VPN Products and Services?
  - Firewalls
  - Routers
  - Remote Access Servers
  - Standalone Servers
  - Third-party VPN Services
- Who Provides VPN Network Infrastructure?
  - ISPs
  - Carriers
  - Access Point Technologies
  - VANs
  - Private Networks
- VPNs for Users
  - Dial-in Users
  - Peer Communications
  - Intranet VPNs
- VPNs for Networks
  - Connecting Enterprise Private Networks
  - Remote Branch Office LANs
  - Access for Corporate Partners

### Comparing VPN Protocols

- Layer 2 Tunneling Protocol
- Secure IP
  - Point-Point Tunneling Protocol
  - Layer 2 Forwarding
  - Secure Sockets Layer
- What LAN Protocols Are Supported?
- What Platforms Can Run VPNs?

## INTEGRATING VPNs INTO YOUR PRIVATE NETWORK

VPNs offer new dimensions to your network's accessibility, but at what price? This section addresses various aspects of VPNs and how they compare with what you've come to expect from your private network.

- Appropriate Business Applications
- VPN vs. Private Network Performance
- Providing Quality of Service
  - Service Levels
  - Bandwidth Management
- Interoperability
- Manageability
  - Administration
  - Accounting
  - Troubleshooting

## SECURITY

Security is the cornerstone of the VPN technology. Explore the risks involved in putting your company's data on a public network and the various components involved in providing VPN security.

- Authentication/Access Control
  - End-station vs. User Authentication
  - CHAP and PAP Tunnel Authentication
  - TACACS and RADIUS
- Encryption
  - Encryption Standards
  - Certificate and Key Technology
  - Network Address Translation
- Management
  - Logging/Auditing
  - Access Control Administration
  - Key Management

## EVALUATING VPN PRODUCTS AND SERVICES

If you're going to implement VPNs for your company, you need to know the right questions to ask vendors when evaluating various VPN implementation options. This section outlines some key areas to investigate.

- In-house vs. Third-party Implementation
  - Service Guarantees
  - Customer Premise Equipment
- What Aspects of VPNs Should Be Tailored to Your Specific Network Needs?
- What Ease-of-Use Features Should You Expect?
- Future Proofing: Scaling and Upgrading
- Reliability
- Performance
  - Hardware-Based Acceleration
- Price

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## ABOUT THE SEMINAR PRESENTER . . .

**Andrew Hacker** is a Senior Engineer/Analyst at The Tolly Group. He provides strategic consulting and industry analysis to leading end-user organizations and government agencies in their assessment and implementation of high-end computer and communications systems. His areas of expertise include ATM, Gigabit Ethernet, and Virtual Private Networks. He has played a vital role in The Tolly Group's development of sophisticated test methodologies for evaluating the industry's leading-edge technology products.

Mr. Hacker's recent speaking schedule includes ComNet, GigNet, and the Gigabit Ethernet Conference. He has authored numerous feature stories in the industry's leading trade publications including *Network World, Data Communications, LAN Times, Internet Week,* and *Business Communications Review.*

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| ❑ October 14 | San Francisco, CA | Sheraton Palace |
| ❑ November 10 | Washington, DC | Sheraton Crystal City |
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AUGUST 24, 1998 VOLUME 15, NUMBER 34

# NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

SPAM SPAM SPAM and more spam

Page 16.

SPOTLIGHT ON TOKEN RING

## Cisco tosses hat in gigabit token ring

**By Marc Songini and Jim Duffy**
*Washington, D.C.*

Cisco Systems last week opened the performance spigot for bandwidth-thirsty token-ring users by demonstrating gigabit token-ring products.

At the Share and Guide Technical Conference here, Cisco showed off a video application made possible by running token-ring frames at 1G bit/sec using Gigabit Ethernet switching and uplink modules in several of the company's

*See* **Cisco,** *page 52*

## Testing LAN options

**By Robin Schreier Hohman**
*Dallas*

BRUCE NEWMAN

**Bancorp-South's David Soper is beta-testing Olicom HSTR gear.**

Nelson Chui was ready to chuck his token-ring net in favor of a less expensive Ethernet environment — but High-Speed Token Ring (HSTR) products from Olicom helped change his mind.

Chui, information systems manager at the UCLA Office for the Protection of Research Subjects, estimates it would cost around $40,000 to change his 40-workstation token-ring network to Fast Ethernet. Worse, he says, it would mean rewiring the entire office and pulling the network down for

*See* **Olicom,** *page 52*

## Compaq's Ethernet ambitions

**By Tim Greene**
*Littleton, Mass.*

The so-far-undisputed champion of PC servers hopes to win belts in a new division: Ethernet quality of service (QoS). If Compaq makes it to the top, that triumph could help the company realize one of its ultimate aspirations — to become a LAN megapower.

But Compaq is not just aiming high. The PC and server giant will also expand its line of low-end workgroup switches to add Gigabit Ethernet uplinks, according to B.J.

*See* **Compaq,** *page 51*

NEWSPAPER $5.00

# Cisco routers open to attack

**By Jim Duffy and Denise Pappalardo**
*San Jose, Calif.*

A bug has cropped up in Cisco Systems' router software that could let unscrupulous users crash the boxes — a situation that has the company's customers scrambling to fix the problem.

The bug, which was found in Cisco IOS software Versions 9.1 and later, makes it possible for unauthenticated users to gain access to the logon prompt of a router. From there hackers could cause the device to crash and reload, according to a field notice posted on Cisco's Web site. To date, no customers have notified the company of malicious exploitation of this flaw, but there have been sporadic reports of unexplained crashes consistent with those caused by this error, Cisco says.

**Cisco routers** *could face assault.*

Indeed, the defect was initially identified because of such a report, the Cisco notice says. But a company official says the bug was also noticed

*See* **Bug,** *page 53*

## The remaking of IPSec

**By Ellen Messmer**
*Chicago*

Call it IPSecond.

That's what IP security experts gathering this week at an Internet Engineering Task Force meeting are dubbing their work on the IP Security (IPSec) draft standard.

The reason: So many changes are being proposed to the original draft — such as new security features and a secure client package — that it will make early IPSec-compliant equipment obsolete. For users betting on IPSec as the primary means of authenticating and encrypting IP traffic, the question will be whether to

*See* **IPSec,** *page 51*

Get more online

- IPSec and IKE draft RFCs.
- A look at another VPN-related protocol: L2TP.

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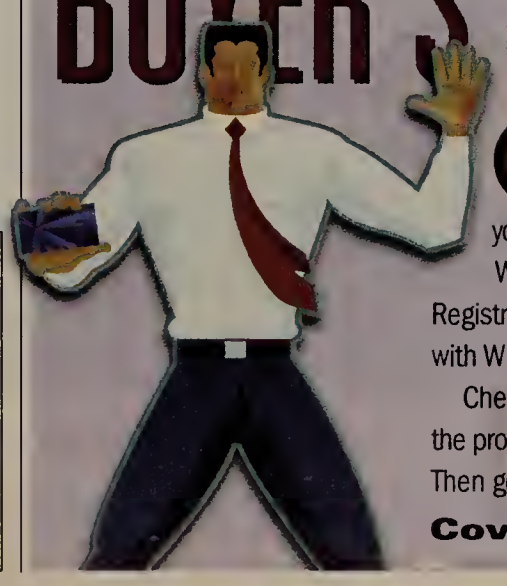
## BUYER'S GUIDE AUTHENTICATION



COURT PATTON

Sophisticated authentication methods are moving from the movies to the mainstream, giving you another way to protect your network from spying eyes.

We tracked down and tested four authentication packages. The National Registry's SAF/nt earned our World Class Award for its seamless integration with Windows NT.

Check out the test results and consult the Issues and Trends story to learn the pros and cons of biometric, smart card and token authentication schemes. Then go to the online Buyer's Guide for details on 27 products.

**Coverage begins on page 35.**

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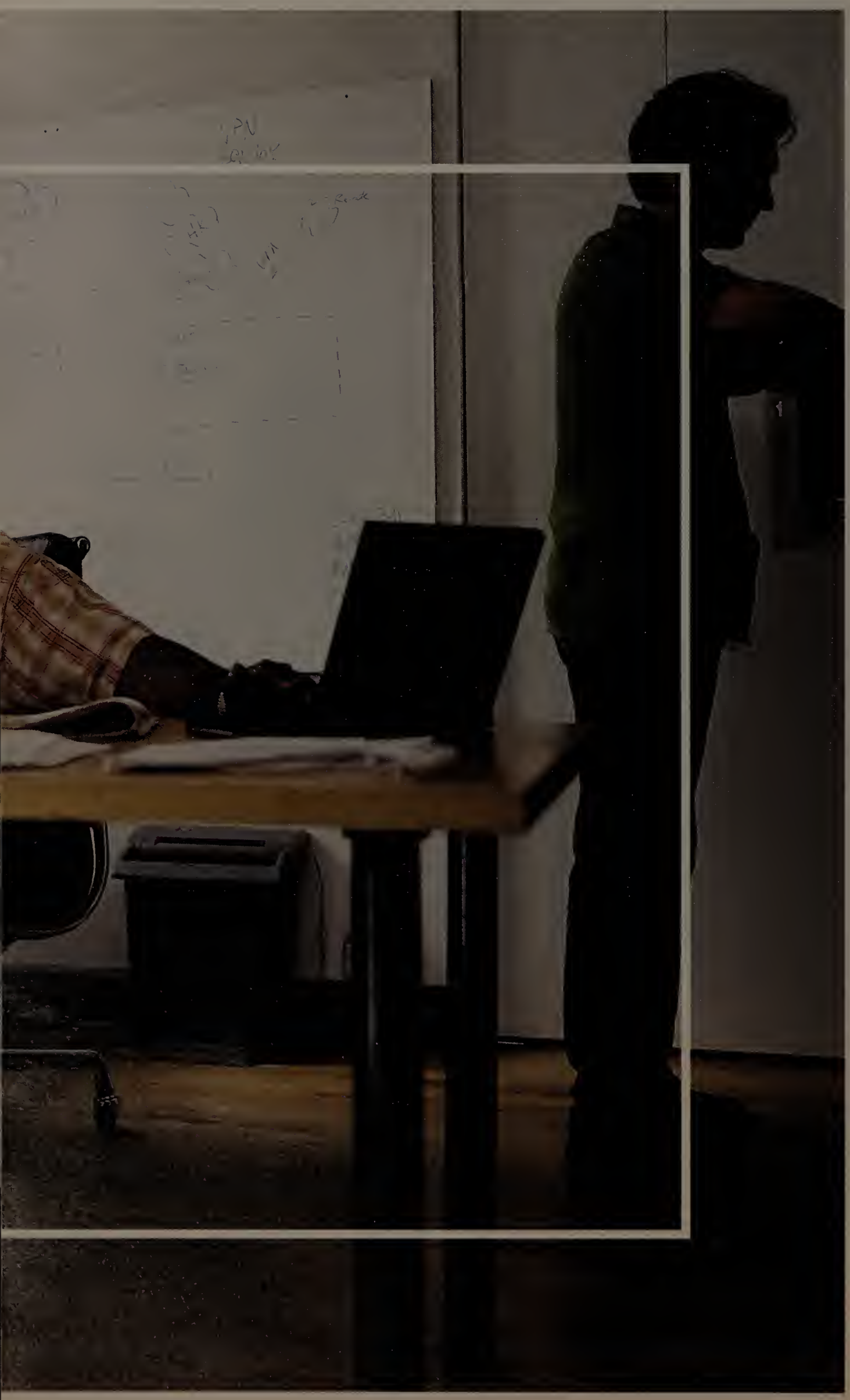
*Performance testing conducted by National Software Testing Laboratories, Inc. (NSTL™) in June, 1998, using Winstone® 98 developed by Ziff-Davis Benchmark Operation (ZDBOp™) across a variety of computers with 32 and 64 megabytes of memory. Tests performed independently by NSTL without independent verification by Ziff-Davis. Ziff-Davis makes no representations or warranties. Winstone is a registered trademark or trademark of Ziff-Davis Inc. in the U.S. and other countries.



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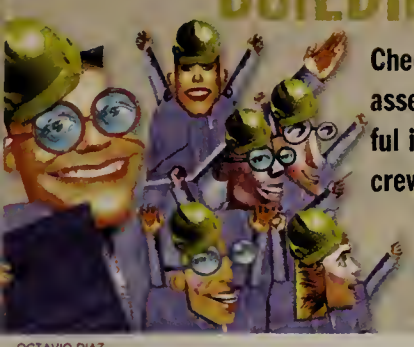


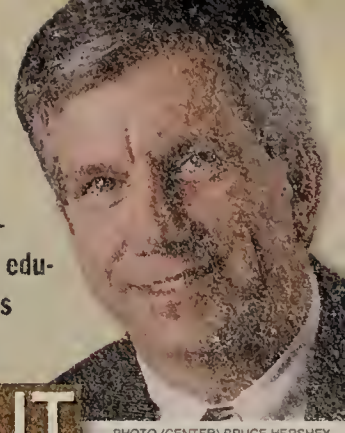
## BUILDING A TEAM

Check out our tips for assembling a happy, successful intranet construction crew. **Page 41.**

OCTAVIO DIAZ

## PRESSING FOR GIGABIT

Corey Van Allen drives graphics house's move to Gigabit Ethernet, which could reach down to the desktop. **Page 17.**



## BLUE RIDGE BRAWL

A shortage of high-capacity bandwidth is hurting West Virginia's education net. Bell Atlantic's Dennis Bone has a solution. **Page 25.**

PHOTO (CENTER) BRUCE HERSHEY

# NetworkWorldContents

*August 24, 1998 Volume 15, Number 34*

## News


8 **New Spectrum** services let users outsource network management duties to Cabletron.

10 **Is it too** late forWorldCom's MAEs? The company's MAE ATM upgrades are finally done, but most ISPs are proceeding with caution.

14 **Users** offer vendors ship date advice.

16 **Suing** a spammer requires finding him first.

16 **How** Hormel slices spam.

52 **IBM** High-Speed Token Ring gear is coming soon.


## Local Networks


17 **Graphics house** paints bright gigabit future.

17 **Windows TSE:** The good and the bad.

18 **Dave Kearns:** I must have been mistaken.


## Internetworks


21 **Hospital's** ATM WAN untangles T-1 snarl, reduces costs.

21 **IBM** tying Netfinity servers directly to mainframe.

22 **Andrew Hacker:** 'Net QoS hurdles cripple enterprise VPNs.


## Carriers & ISPs


25 **Sparks fly** over bandwidth storage.

25 **Five cities** got Rhythms.


**SPECIAL FOCUS**

*NT 5.0 planning*

To really pay off, Active Directory Service needs thought, careful preparation. **Page 19.**


26 **David Rohde:** IP convergence and your telecom contract.


## Intranet Applications


27 **Hospitals** stitch together critical intranet.

27 **Firewall market** blazing, up 143%; More companies on the Internet means more firewalls.

28 **Scott Bradner:** How many 9s are enough?


## Technology Update


31 **Access specification** opens WAN ATM door.


## Management Strategies


41 **Team intranet:** IT managers say building a diverse, harmonious construction team is the first step toward a rock-solid intranet.


## Opinions


32 **Editorial:** Challenge Part II: This time we are challenging the Layer 3 switch vendors to a showdown.

32 **Winn Schwartau:** Of DIRT and placebos: Security gets scary.

33 **David Rohde:** The FCC is thinking too hard.

54 **Mark Gibbs:** From spam to propagandaware.

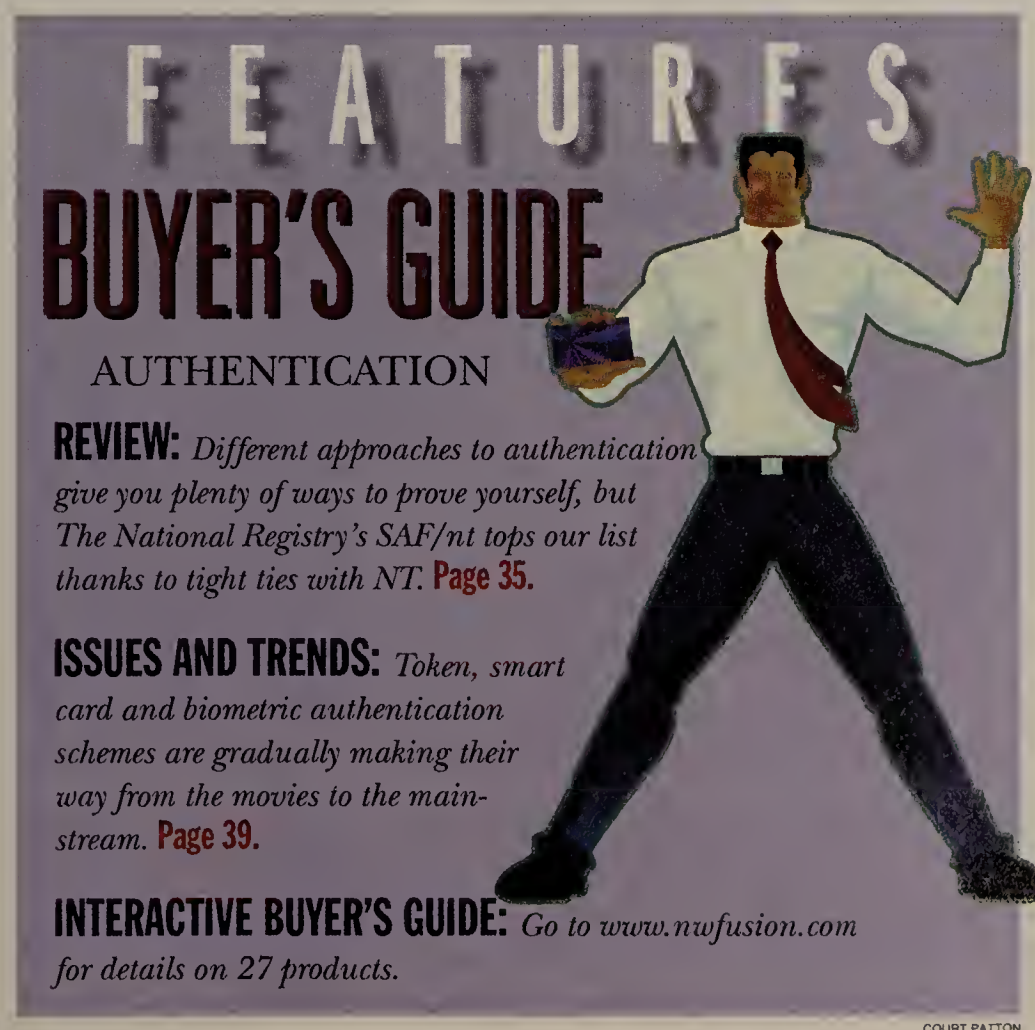
54 **'Net Buzz:** The HotSpot myth; Entrust makes Wall Street splash; Stock talk or sex talk?

**Net Know-It-All.** Page 10.

**Network Help Desk.** Page 31.

**Message Queue.** Page 32.

**Editorial and advertiser indexes.** Page 50.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### This Week

#### Only on Fusion

**Directories.** What's the deal with Cisco — why won't it support Novell Directory Services? Some users of Cisco and Novell networks are pretty steamed. Read their comments, then add your own. **DocFinder: 8536**

**Water Cooler.** Danny Partridge does domains. Online Reporter Sandra Gittlen finds some unnerving similarities between the current domain-name flap and *The Partridge Family.* **DocFinder: 8534**

**Keeping Current.** Should you risk your hard-won capital budget on gear from a start-up? Fred McClimans discusses the issue. **DocFinder: 8535**

**Daily news.** Get a daily digest of breaking network news delivered to your mailbox. Sign up for our free NetFlash newsletter. **DocFinder: 8537**

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## News briefs, August 24, 1998

### Bill Gates: Shrinking violet?

CINDY CHARLES

**Gates** *fought to testify in private.*

Not ones to shrink from the media spotlight when they really want it, Bill Gates and his Microsoft compatriots last week received judicial permission to run and hide from the "media circus." An appeals court granted Microsoft's request to stay a ruling in the government antitrust case against the company that would have made depositions of senior company executives open to the press and public. "The balance of harms favors" Microsoft, the court said. The U.S. Department of Justice, 20 U.S. states and the District of Columbia have accused Microsoft of illegally using its dominance in the PC operating systems market to control other software markets, particularly the Internet.

### Cisco goes shopping again

In the past five years, Cisco has spent about $7 billion to acquire 25 companies. So it came as no surprise when the router giant last week said it would buy American Internet, a privately held Bedford, Mass., firm that makes software for IP address management and Internet access. Cisco will exchange $56 million of common stock for all outstanding shares and options of American Internet. Its chief executive, Bob Brennan, will continue in his current position, reporting to the head of Cisco's service provider line. Cisco expects the acquisition to be completed by early October.

### SBC heads to the courtroom again . . .

The ink was barely dry on a recent action by the Federal Communications Commission attempting to deregulate regional Bell operating companies' data services when SBC Communications headed to its favorite court to complain. SBC has asked the U.S. Court of Appeals in St. Louis to review a part of the FCC's action — the one part that's an order rather than a proposal — that states RBOCs must unbundle and resell digital subscriber line and other services to competitors unless they set up a separate data-services subsidiary. SBC protested that federal law requires the FCC to free up RBOCs from the requirements on broadband services, even without a separate subsidiary.

### . . . but the FCC scores a rare legal victory

Oddly, on another matter, the same court last week didn't treat the RBOCs so kindly, though it didn't really please the long-distance carriers, either. The St. Louis court ruled that the FCC struck the right balance last year when it implemented a new system under which RBOCs must reduce their per-minute access charges — the amount long-distance carriers pay to have their traffic completed — every year on a gradual basis. The RBOCs complain the cuts were too deep, while the long-distance carriers say they were too skimpy. The court also upheld the FCC's May 1997 decision not to force ISPs to pay any of the Bell access charges.

### IP fights the power

Research reports are kind of like opinions: Everyone has one and all of them are different. Still, according to a new study from Insight Research, demand for broadband IP services could force down the prices of high-speed private leased lines. Telecommunications carriers offering private lines such as T-1, T-3 and DS-O are still likely to see revenue growth of 8.8% annually through 2002 because the lower prices will probably spur demand, the report says. But for corporate users, that could mean lower prices as new IP broadband carriers such as Level 3 Communications and Qwest Communications put competitive pressure on traditional carriers such as AT&T and MCI. For more insight, go to www.insight-corp.com.

# New Spectrum services shift maintenance to Cabletron

*Company offers to bring disgruntled users up to speed as part of new service.*

**By Robin Schreier Hohman**
*Durham, N.C.*

Cabletron is looking to challenge Tivoli and Computer Associates in the professional services market with the introduction of a remote management service that promises to take the pain out of managing Cabletron's Spectrum network management software.

Under the Remote Spectrum Administration Services program Cabletron announced last week, customers can outsource Spectrum enterprise WAN and LAN management to Cabletron's Durham, N.C., service facilities.

Managing far-flung enterprise systems is an increasingly complex job, Cabletron officials say. With the new service, Cabletron will install, configure, trouble-shoot and run the Spectrum system.

"I would rather spend my time monitoring and designing and maintaining the network than the network management platform," says Kalpesh Unadkat, a computer consultant at the University of Michigan Medical Center, a hospital and medical school in Ann Arbor. Unadkat estimates it will take him two to three weeks to install the Spectrum 5.0 upgrade on his three Spectrum servers and eight client machines.

One problem: security. Because most of the service is handled via a remote link from a customer's site to the Durham location, security can be a concern. With that in mind, however, Cabletron believes it has built a network-industry Fort Knox in its Network Operations Center, also called SmartNOC.

> *"I would rather spend my time monitoring and designing and maintaining the network than the network management platform."*
>
> **Kalpesh Unadkat,** *computer consultant, University of Michigan Medical Center*

The SmartNOC service network is isolated from Cabletron's internal network — even e-mail between the two systems can't be exchanged. That's not all. Before Cabletron will take on new customers, it brings in an outside security company to detect security flaws in the customer's network, then sends the customer a report on how to fix its problems.

The main obstacle Cabletron will face in selling the new service is convincing people that it's OK to allow access to their networks, says Chris Jackson, Director of Cabletron's Remote Management Services.

But Jackson's got an argument for that: He points out that Cisco customers routinely let technicians dial in to their routers to solve problems.

"When a customer calls in and says, 'I need help,' and you can't visually see what he's doing, it's very frustrating," Jackson says. With the new service, a Spectrum engineer can log on to your network using pcAnywhere connectivity software, and see the problem.

The Remote Spectrum Administration Services' base fee of $36,000 includes installation, daily health checks for a year, monthly backups onto tape or disk and all upgrades. Customers can buy extra service hours at $200 per hour or in packs of 100 hours for $18,000.

Cabletron declined to predict revenue, but company officials say if they only get a third of the installed Spectrum base — 3,000 users — they'll generate at least $36 million per year.

© Cabletron: (603) 337-9400

QUICK TAKE: CLUSTERCATS TURBO

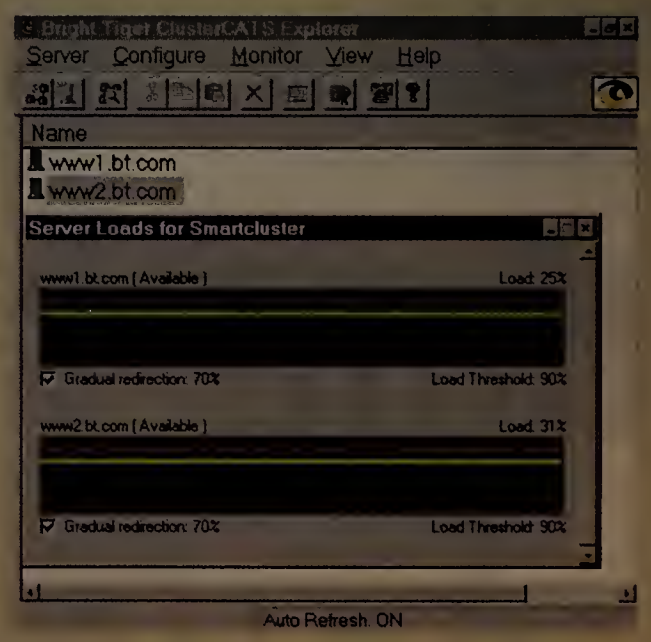
## Bright Tiger takes bite out of Web cluster prices

Bright Tiger has just unveiled a low-end version of its Web server load-balancing software. ClusterCATS Turbo clustering software, which sells for $795, can spread processing across two servers and supports Microsoft's Internet Information Server for Windows NT and Netscape's Enterprise Server running on Solaris.

The software also supports server failover, session state management and remote management via ClusterCATS Explorer.

Bright Tiger also hopes to attack performance problems with Microsoft Active Server Pages (ASP). Its weapon? A new ASP accelerator for the low-end clustering software that will be added to the company's higher end enterprise edition. The company is also offering a CGI accelerator.

**Bright Tiger:** (508) 263-5455 or www.brighttiger.com



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# Is it too late for WorldCom's MAEs?

*The company's MAE ATM upgrades are finally done, but most ISPs are proceeding with caution.*

**By Denise Pappalardo and Sandra Gittlen**

The ATM switches are in and the tools have been developed, but WorldCom is still missing one major ingredient that would make its metropolitan area exchange (MAE) upgrades a success: the backing of ISPs.

In the past two years, WorldCom has invested $10 million in its MAEs in San Jose, Calif., and Vienna, Va., in addition to building a new MAE in Dallas (*NW,* Jan. 26, page 1). The company also equipped its MAEs with Cisco BPX ATM switches as part of an overall move to ATM (see graphic).

But while WorldCom has been busy deploying its ATM switches and developing software to help users manage their MAE connections, ISPs have not been idle.

Responding to user complaints about packet loss at the MAEs and nationwide network access points, ISPs have sought out alternatives such as private peering and the new brokered private peering approach.

"ATM is a step in the right direction, but it's not clear that WorldCom will be able to solve all of the congestion and loss problems at the MAEs by simply adding ATM," says Rick Bubenik, vice president of engineering at St. Louis-based ISP Savvis Communications.

Bubenik's skepticism is backed up by mathematics. Last year, the traffic through the MAEs doubled, says Andrew Odlyzko, head of the mathematics and cryptography research department at AT&T Labs. But this year has been a different story.

"The growth rate at the MAEs should have been 50% to 60% this year. However, it is only 20%. It has not increased substantially, yet traffic on the Internet has been doubling each year," Odlyzko says.

### Turning the tide

WorldCom is hoping to attract more traffic to the MAEs with its ATM upgrades. The company is supplementing its aging Digital FDDI GIGAswitches with Cisco's BPX ATM switches.

WorldCom has also developed a Web permanent virtual circuit tool to give ISPs more control over their bandwidth, says Dan Lasater, director of broadband applications at WorldCom. The tool will let ISPs adjust the faucet on their ATM pipe in real time. With FDDI, ISPs could not control their connections.

But even with all these improvements on the way, WorldCom is still having a difficult time wooing ISPs back to the public peering side of the Internet. WorldCom has to contend with the fact that not too long ago ISPs had to explain a nearly 40% packet loss at MAE-East to frustrated users. ISPs are not anxious to repeat that experience.

This may be one of the reasons WorldCom has run its ATM beta trial at MAE-West for nearly eight long months. WorldCom wants to be absolutely sure its ATM services are going to give ISPs a sound alternative before launching a widespread deployment. Six national ISPs are part of WorldCom's beta trial, but the official ATM service has not been turned on at any of its MAE sites.

WorldCom also claims ISPs have placed orders for the ATM service, but says the orders will not be filled until October.

But some ISPs say they are hesitating because they want to be sure the service is as good as WorldCom is promising.

### Keeping their options open

WorldCom may face an uphill battle trying to lure back ISPs that have switched to private peering. In late 1995, UUNET Technologies, MCI and GTE Internetworking led the way in developing private peering agreements (*NW,* May 5, 1997, page 1).

ISPs that have private peering agreements typically have two or more high-bandwidth dedicated connections between their networks, which they use to exchange traffic. Private peering offers business users more reliable transport of their traffic over the 'Net.

While all three aforementioned ISPs still have connections at the MAEs, the traffic carried on the MAE connections today is inconsequential compared with the ISPs' total traffic.

But now another group of ISPs, led by Savvis, is developing brokered private peering (BPP).

The approach is yet another alternative to public peering. BPP aims to establish at least nine exchange points around the country in a tic-tac-toe pattern in which ISPs will peer, says Dorn Hetzel, director of network architecture at Epoch Internet.

ISPs that join the BPP plan will be interconnecting under a more stringent set of rules than those imposed at public peering sites, he says.

In order to ensure packets are not dropped, the ISPs will be connecting to BPP using high-speed ATM connections. The ISPs will also have to carry users' traffic as far as possible on their own networks before simply dumping it onto the peering points, Hetzel explains.

### Getting back on track

WorldCom realizes that competition to control Internet traffic is coming from all corners of the industry, and that users stand to benefit from the competition. ISPs and users like the idea of WorldCom finally upgrading its peering points to a more robust and scalable ATM technology.

One of the biggest benefits of ATM is the higher bandwidth that can be supported. "If you can bring in one OC-12 line for your traffic, it's more efficient than having a bunch of OC-3s in terms of price and performance," says John Curran, chief technical officer at GTE Internetworking.

FDDI, which WorldCom has historically used at all of its MAE sites, hits the ceiling at 100M bit/sec. The MAEs' ATM services start at 45M bit/sec and range up to 622M bit/sec, WorldCom's Lasater says. WorldCom also plans on supporting OC-48 ATM services in the near future, he says.

"ATM makes us reevaluate whether it makes more sense to go to more public peering," GTE's Curran says.

If the MAEs become more reliable and less congested, GTE Internetworking may consider leaving traffic at the MAEs and slow its move away from the public sites, Curran says.

One enterprise user is looking at eliminating the middleman — his ISP — to reap the benefits of an ATM MAE. "We are thinking about collocating at MAE-West," says Mark Sanders, director of MIS at MetaCreations, a Carpinteria, Calif.-based graphics tool developer.

Today, MetaCreations collocates its servers with Digex, Intermedia Communications' ISP subsidiary. However, Sanders believes deploying a server at MAE-West may improve Internet traffic performance because he will be able to send his Internet traffic directly to a variety of ISPs.

But other users just don't like the idea of public peering points.

"On paper, ATM should be better, but I'll wait and see," says Dwight Gibbs, chief technical fool at online financial advisor The Motley Fool. "In the meantime, I'm still hammering away at my ISP to do private peering.

"There's still the problem at the MAEs that you don't know who to blame if there's a problem," Gibbs says. "If something's wrong at the private peering point, you know who to blame." ■

## SPENDING SPREE

**WorldCom planned to spend $10 million over two years to upgrade its two main MAE points and build a third. The money is pretty much gone, according to Dan Lasater, director of broadband applications at WorldCom. Here's what the company did:**

**MAE-East in Vienna, Va.:**

- ☑ Deployed three Cisco BPX ATM switches.
- ☑ Built ATM operations in main WorldCom buildings.

**MAE-Central in Dallas:**

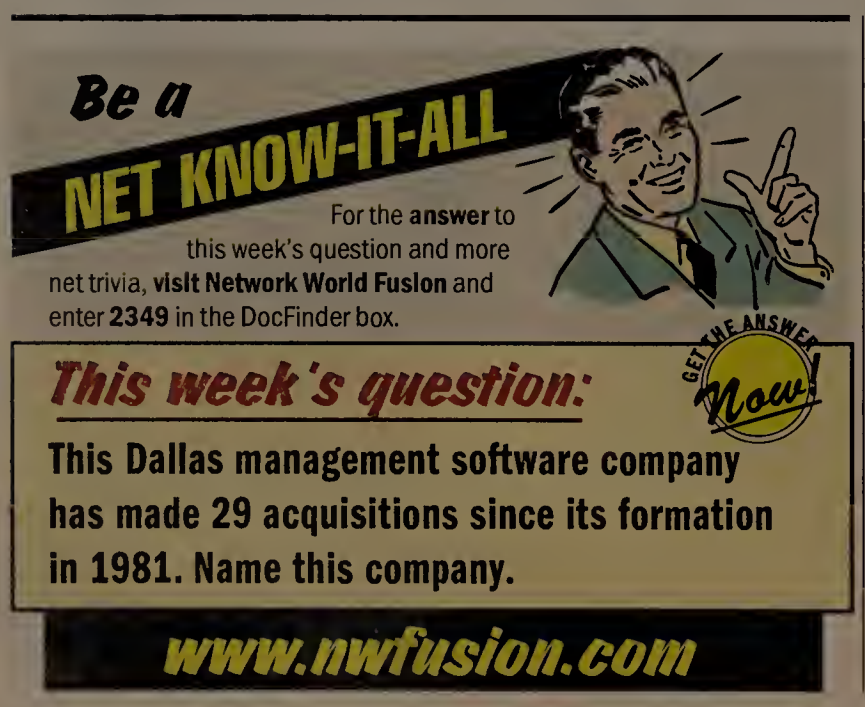
- ☑ Created new facility.
- ☑ Deployed two BPX switches.

**MAE-West in San Jose, Calif.:**

- ☑ Deployed three BPX ATM switches.
- ☑ Moved to a new site with more space.

**Other:**

- ☑ Bought seven BPX ATM switches to be deployed at other MAE sites.
- ☑ Developed Web PVC provisioning tool.
- ☑ Deployed management system for provisioning tool.

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# Users offer ship date advice

By Paul McNamara and John Cox

It may be today's most often-asked yet unanswerable IT question: When will Microsoft deliver Windows NT 5.0? After a handful of delays, Microsoft now refuses to say, at least publicly.

NT 5.0 is just the latest in a string of important products that blew well past their original ship dates, including sundry versions of Lotus Notes, Windows 95 and Microsoft Exchange. Some key technologies, such as IBM's WorkPlace OS, never even saw the light of day despite the announcement of firm ship dates.

All of which leads to this question: What do customers want and expect from vendors in terms of setting and honoring product delivery dates?

Customers want deadlines met, of course, but most network managers have been around the block often enough to know that's always an iffy proposition.

"What would make sense are regular updates if products are behind schedule," says Jim Santiago, assistant vice president of information services at AEW Capital Management in Boston. "Usually vendors don't give you any information until the deadline passes."

Vendors may want to consider more of a "windowing" approach to their shipment projections, says Ron Kane, project director of new technology for the city of San Francisco.

"Maybe it's time to have two types of release dates, one estimated early on and then an actual release when it looks like things are really going to happen," Kane says.

More detailed information issued further in advance would also be useful, according to another IT manager.

"It would help if vendors could publish product release road maps with features planned and dates of the alpha, beta and first customer ship releases for, say, two years," says Bruce Reed, manager of technical services at Intrinsa in Mountain View, Calif. "However, that's not realistic in today's environment" of rapid technological advancements and fierce competition, he adds.

**National** *Semiconductor's Gibson has his own formula to determine dates.*

As for other advice for vendors, customers interviewed say vendors should do the following:

- Resist the temptation to not issue a date. When cutting-edge technology matters, planning for its arrival is important.
- Be realistic. A wildly optimistic date may help vendors freeze markets but not without paying the price of lost credibility.
- Be candid. If it's known beforehand that a promised feature will not make the final release, tell customers early so they can adjust.
- Put quality and stability first. The usability of a product is more important than meeting deadlines.

Microsoft, for its part, believes that holding out on NT 5.0's due date is the company's only responsible course, given the product's well-documented complexity.

"If we were to announce a date, that would show we aren't serious about quality," NT 5.0 architect Mark Brown recently told *Network World.*

While agreeing with Brown in principle, not every case is clear-cut, according to Phil Gibson, director of InterActive Marketing at National Semiconductor in Santa Clara, Calif.

"If it's a breakthrough technology and there's no way to do the job otherwise, then I really do care about the release date," Gibson says. "If they miss it, that makes me miss my schedules one for one."

Gibson has his own equation for applying a reality adjustment to vendor promises. "I always sandbag their delivery dates by at least nine months," he says.

Others are even more circumspect.

"We don't make plans based on vendor announcements, because it's so common for things to be late," says Angel Cortez, senior systems analyst at Nordstrom, a Seattle-based retailer. "Our planning really starts when we get the actual product. That's because you don't always end up with what the vendor says you're going to get in the final release."

Getting promised features in a product "is probably more important than getting it out in a timely fashion," says Jerry Fain, manager of information technology at Winter, Wyman & Co. in Waltham, Mass. He would like to see vendors be more forthcoming about features that fall off the drawing board.

They also shouldn't "force a product out the door because that's worse than missing a deadline," Fain adds. "It's an administrator's nightmare to put something in that causes headaches."

The better-late-than-lousy camp has plenty of members.

"From the technology standpoint, I prefer something that is really working" to making an arbitrary delivery date, says Kevin Chou, an independent consultant in New York.

It isn't necessarily the major operating system upgrades that most concern customers. For example, San Francisco's Kane says his department is anxiously awaiting the release of the Domino 5.0 messaging and Web application server from Lotus, a company that has had trouble meeting Notes and Domino delivery dates in the past.

"If Domino 5.0 slips, that would be of more concern than an NT 5.0 slip," Kane says.

Many organizations would rather bypass delivery date uncertainties altogether.

For example, the NT delays won't have any impact at snack maker Nabisco "because NT 5.0 isn't even budgeted for yet," says Joe Brand, lead LAN analyst at the company in Parsippany, N.J. "We'd never even make a deployment proposal to senior management until it was ready."

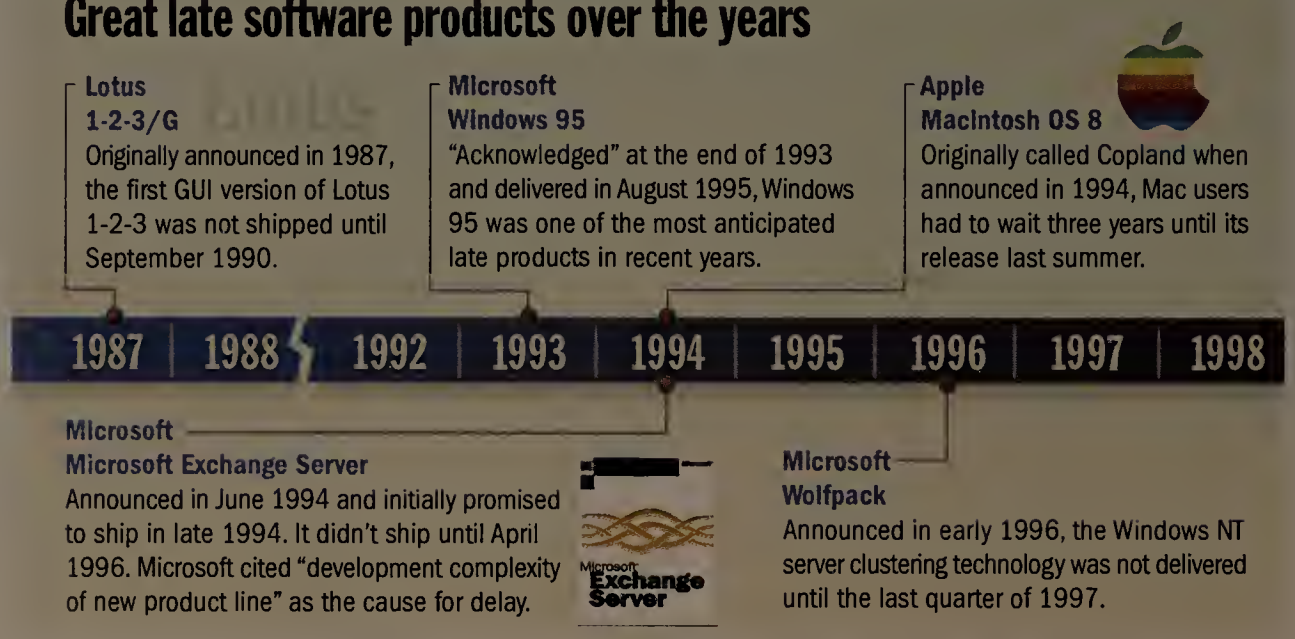
And customers are not the only parties that have a stake in delivery date promises.

"The software industry is a well-knit network," says Eric Brown, an analyst with Forrester Research in Cambridge, Mass. "If I am a software vendor banking on the next great version of my product, but it is dependent upon, for example, Active Directory, I have a problem."

The bottom line for satisfying independent software vendors and corporate users should be obvious, according to Chris Miller, senior systems manager at Catalyst Solutions Group in St. Louis.

"Exceeding the customer's expectation" should be the ultimate goal of vendors, Miller says. "Tell people it's going to be delivered in November and come out with it in September if you can," he says. ■

## Great late software products over the years





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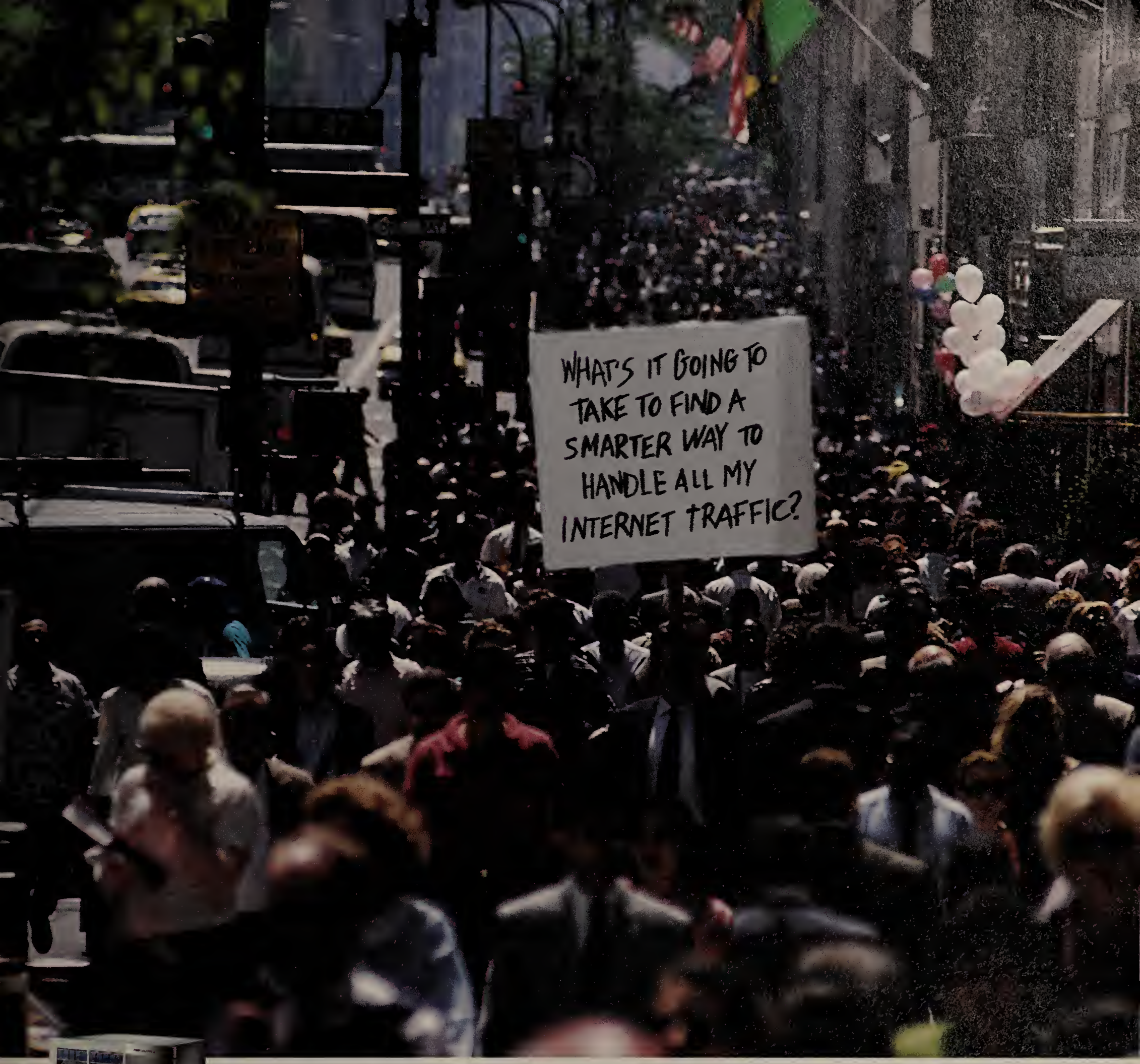

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# Suing a spammer requires finding him first

*Washington state statute promises to prevent rampant spamming by fining senders per e-mail message.*

**By Paul McNamara**
*Issaquah, Wash.*

Here's the theory: Give every e-mail recipient in the state of Washington the legal firepower to sue junk e-mail senders, and watch those spammers scurry for cover.

The problem, however, is that many spammers are already undercover. They're so well-hidden, in fact, that simply finding them can be a challenge for those wanting to sue using Washington's new antispam law. As for collecting an actual court judgment, that may make the initial hunt look relatively easy.

Nevertheless, early users and proponents of the Washington law believe it holds great promise for frightening a lot of spammers into at least behaving better, even if it won't bankrupt many of them. Passed earlier this summer, the statute allows Washington residents to sue spammers in civil or small claims court. Penalties of $500 per spam message paid to recipients and $1,000 per message paid to e-mail account providers may be tripled by a judge.

The law requires senders to determine whether an e-mail address resides in Washington, which can be a difficult task. Antispam activists believe, therefore, that the less brazen, more amateurish spammers outside of Washington could simply stop spamming altogether rather than risk running afoul of the statute.

> *"Whether or not we end up collecting lots of money, we want to make it clear that there is an economic downside to sending spam."*
>
> **Adam Engst,** *publisher, TidBITS*

There are early signs that deterrence may indeed be a byproduct. After merely threatening to sue, one Washington resident reportedly received $200 from a company that had sent him spam.

"Whether or not we end up collecting lots of money, we want to make it clear that there is an economic downside to sending spam," says Adam Engst, who last month filed the first actual lawsuit based on the statute. Engst is publisher of TidBITS, an electronic newsletter that focuses on Macintosh and Internet issues.

The target of his civil suit is WorldTouch Network, a Los Angeles-based company that peddles a product called Bull's Eye Gold, which, ironically enough, is used by spammers to harvest e-mail addresses off of Web pages. Engst says he and three colleagues, who are also parties to the suit, received about 100 copies of the Bull's Eye spam in a single month.

"We had no trouble finding WorldTouch as far as identifying them for the lawsuit," Engst says, noting that the company's phone number and address were in the spam. However, he adds, "We have not been able to find the principal of the organization."

That would be Christopher Lee Knight, a man notorious among antispam activists for the high volumes and repetitiveness of the unsolicited commercial e-mail he sends. California law requires that the principal of an unincorporated company be personally served notice of a civil suit.

"He is one of the most reviled spammers so far as I can tell from reaction that we've gotten to this lawsuit," says Brady Johnson, Engst's attorney.

Messages left last week by *Network World* for Knight at WorldTouch were not returned.

Johnson says he was told last week that the company's L.A. office is sporting a new "out of business" sign, although he has not been able to confirm that development.

"We're still trying to track down Knight's home" by using a process server, Johnson says. "I think we're closing in, and I have good reason to be very optimistic that we'll have him probably within the week."

Should they fail, however, the plaintiffs may still fulfill their obligation to notify Knight by publishing ads in L.A. newspapers and legal journals.

All of this can get expensive and time-consuming.

Nevertheless, Engst and Johnson do not believe such difficulties should or will discourage others from using the law. They do, however, acknowledge that even the most determined spam fighters have their limits.

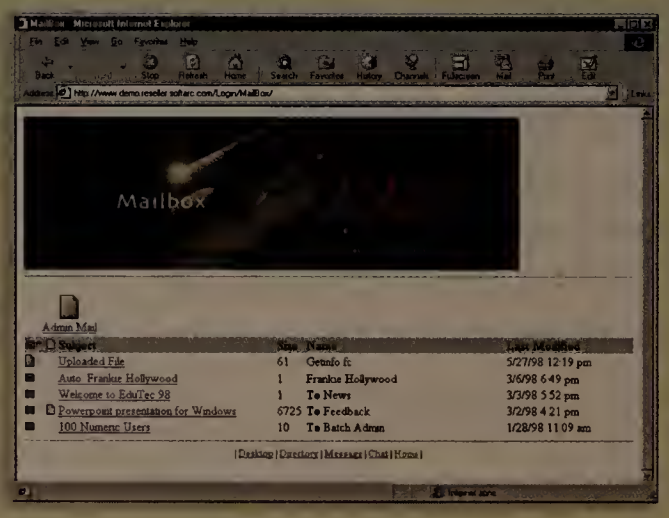
"Where's your cut-off?" Engst asks. "How much money do you want to spend in trying to track this guy down?"

Paul Hoffman, director of the Internet Mail Consortium, believes that antispammers will relish the opportunity granted them by the Washington law.

"It takes somebody who is willing to go out on a limb," Hoffman says. "These are people who really care about the Internet." ■

QUICK TAKE: FIRSTCLASS INTRANET SERVER 5.5

## SoftArc beefs up intranet server




Customers will find a passel of new and useful Internet messaging features tucked inside the latest version of FirstClass Intranet Server (FCIS) from SoftArc, according to beta testers.

SoftArc last week began shipping FCIS 5.5. New features include message collection from a remote Internet mail server through dial-up Simple Mail Transfer Protocol support; Java-based chat; support for Lightweight Directory Access Protocol; and a bundled FirstClass Rapid Application Developer, which is a tool set for creating intranet applications and enterprise database interfaces.

Beta tester Sean Murphy, project director at Emory University in Atlanta, says the FCIS 5.5 client interface "looks better and is more configurable" than the current version. The Web interface has also been improved, he adds.

FCIS costs $995 plus a per-user fee of $35 to $70 depending on the size of an installation. Discounts are available for educational institutions.

**SoftArc:** (905) 415-7000

## How Hormel slices it

What's the difference between spam and SPAM?

One is an unappetizing mass of dubious byproducts that most people find disgusting.

The other is a popular luncheon meat.

While veterans of the war against junk e-mail certainly know the difference, Hormel Foods, the maker of SPAM, is intent on drawing the distinction more clearly for the masses. Hormel recently posted a Web site dedicated exclusively to its brand of SPAM (www.spam.com). The site also explains the company's take on e-mail spam.

**Will the real SPAM** *please stand up?*

"We do not object to use of this slang term to describe UCE [unsolicited commercial e-mail], although we do object to the use of our product image in association with that term," Hormel huffs. "Also, if the term is to be used, it should be used in all lowercase letters to distinguish it from our trademark SPAM, which should be used with all uppercase letters."

Got that?

*— Paul McNamara*

## Briefs

■ **Allied Telesyn** *continues to push into the conversion market, this time with two-port switches that* **convert 10/100M bit/sec Ethernet over copper to Fast Ethernet over fiber.** *Each switch will cost less than $400 and sport one port of 10/100M bit/sec copper and one of 100M bit/sec fiber, for ST or SC fiber connections. The AT-FS20x switches provide full-wire speed forwarding and filtering at 148,000 packet/sec for Fast Ethernet and 14,800 packet/sec for Ethernet. They support more than 8,000 media access control address table entries, and can provide a full-duplex link to any device.*

*✆ Allied Telesyn: (800) 424-4284*

■ *Support for NetWare 5.0 and Windows NT Console are among the highlights of* **ManageWise 2.6, Novell's network management product,** *which the firm began shipping last week. The new version uses SNMP alarms to let customers monitor problems that crop up in Novell Directory Services. It also has been designed to operate better with ZENworks, Novell's desktop management and software distribution product. ManageWise 2.6, which is Year-2000 compliant, costs $795 for a five-user license.*

**ManageWise 2.6**

*✆ Novell: (801) 429-7000*

■ *The* **Wireless LAN Alliance** *has completed a study that details the return on investment from wireless LAN technology. The study found wireless LANs generally pay for themselves in less than a year, through productivity gains or avoidance of wired LAN costs. The alliance's director, Mack Sullivan, says wireless LANs are poised for big growth in the area of general office networking.*

*In-Site*

## Graphics house paints bright gigabit future

**By Robin Schreier Hohman**
*Irvine, Calif.*

If you ask Corey Van Allen about the old days, before he put four Foundry Networks' Gigabit Ethernet switches into his network, he'll tell you about them, but he's not really reminiscing. It's more like he's reliving a nightmare.

Van Allen, the network manager at Primary Color, a prepress graphics house based here, says that his old network ran on 10M bit/sec Cisco EtherSwitch 1220 switches. With graphics-intensive files topping 900M bytes and more, the network couldn't even move most of the stuff. Instead, Van Allen had to run jobs off removable media, forcing his production people to carry around Jazz disks as if they were newborn infants.

**Van Allen** *wouldn't mind gigabit to the desktop.*

BRUCE HERSHEY

There they were, Van Allen remembers, running to one machine for color retouching, then to another for page layout, then to another for output. Then it was back to square one, picking up another job as the output machine spent all day churning out a customer proof. If everything went well, they would plop the Jazz drives into the archive bin. And later, if someone needed that Jazz disk, well, pity the poor archivist.

### Getting committed

Late last year Van Allen committed himself to finding a Gigabit Ethernet box that would take the load off his people and move it to the network.

After going through several vendors that promised him the moon but didn't deliver, Van Allen turned to Foundry.

He solved his sneakernet problem by installing a TurboIron switch with a switching capacity of 4.2G bit/sec and four Gigabit Ethernet ports in the backbone. One port goes to a Sun Enterprise 3000 server; the others go to three FastIron stackable switches. The FastIron switches, which have 16 10/100M bit/sec ports and one Gigabit Ethernet uplink, connect to desktops and output devices.

Van Allen, who also gave his workstations (a combination of Macs and PCs) a boost with 100M bit/sec network interface cards, expected some collisions, but hasn't had a problem since the switches went in, in December. Primary Color's second site, in Culver City, Calif., has a mirror network and will soon have Foundry's BigIron 4000 as well. The BigIron 4000 is a chassis-based switch, and so far Van Allen plans to populate it with two 24-port 10/100M bit/sec blades and one four-port Gigabit Ethernet blade. He expects to get the switch in about a month.

But his real nirvana, he says, will come when he can go Gigabit to the desktop. In fact, he can't wait.

✆ Foundry: (888) 887-2652

## Win TSE: The good and the bad

**By John Cox**

Although demand for Microsoft's software for Windows terminals is growing, some users and resellers are grousing about last-minute distribution delays, higher than expected costs, inflexible licensing and a long wait before important new features will be added.

Windows NT Server 4.0, Terminal Server Edition (TSE) is now shipping in quantity, after an array of delays in the distribution channel. Microsoft says the delays were due partly to the fact that some distributors apparently did not order enough copies to meet the pent-up demand.

Pricing is still a concern for some customers, especially for those using TSE's predecessor, Citrix Systems' WinFrame, and for those that have not yet adopted Windows NT Workstation 4.0 as their desktop standard. Each TSE user must have a full complement of NT licenses, which could cost up to $8,450 per person, even if the user is only casually accessing applications from the home or over the Internet.

In light of that cost, some customers are sticking with WinFrame, which is based on NT Server 3.51.

"One IS Manager said to me, and I quote, 'I'll be damned if I'm going to spend $40,000 on NT Workstation licenses just to get the NT 4 interface,' " according to a systems integrator who specializes in thin-client computing.

### What will Microsoft do?

Microsoft won't change the basic pricing. Nor has it yet hammered out a more flexible licensing agreement for customers accessing TSE from home or via the Internet, according to Solveig Whittle, a TSE product manager with Microsoft's Personal and Business Systems group. "We're working on these [issues], and hopefully will be addressing them in the pretty near future," she said.

### Work area ahead

Meanwhile, work has already begun on integrating the TSE code into the next major release of NT, Version 5.0, and Microsoft is prepping a bevy of new features (see graphic). Once integrated, administrators will be able to activate TSE during the installation of the operating system.

But don't expect the new features soon: Microsoft won't make interim releases, Whittle says. The new features won't be included until NT 5.0 ships, which some observers expect later rather than earlier in 1999. ■

### SERVING UP CHANGES TO NT TERMINALS: WHAT TO EXPECT

- Performance improvements, shadowing, multimedia and local printer support, and "some kind of load-balancing feature."
- Special licensing for users connecting to corporate TSE servers from home or via the Internet.
- Integration of TSE with NT 5.0 is now under way. TSE will become an option that can be selected when installing NT.

**Get more online:**

- **Our review of TSE.**
- **A detailed look at TSE pricing.**

8525

WIRED WINDOWS

# I must have been mistaken

It's August. Most of you are on vacation (so you aren't reading this), about to go on vacation (so you put this issue aside until you return) or just back from vacation (in which case you're so busy fighting the brush fires that broke out while you were away, you'll never get to the stack of magazines you set aside). It seems like the perfect time to make corrections to some of the things I've written recently.

In particular, I want to clear up some of the issues raised in the column about Microsoft's Small Business Server and Novell's NetWare for Small Business (*NW*, July 27, page 20).

It's true, as I said, that Microsoft's product will coexist with other NT servers on the same net. But there is a limitation in that the Small Business Server must be the primary domain controller and there must be only one domain (Small Business Server doesn't support trust relationships). This effectively limits any network to one Small Business Server.

NetWare, on the other hand, supports any number of NetWare for Small Business servers on the same net. The limitation here is that all NetWare for Small Business servers must be in the same Novell Directory Services partition. I was wrong, then, to award the points to Microsoft. At best this is a wash for Redmond, while at worst it's a clear win for Novell.

In my recent column about biometrics (*NW*, July 20, page 22 ), I overlooked perhaps the oldest biometric authentication method — signatures. I failed to mention that CyberSIGN, Inc. (www.cybersign.com) has released the third generation of its biometric signature verification technology. Should you think that forging a signature is very low tech, read on.

**Dave Kearns**

Besides simply recognizing the appearance of the signature, Cyber-SIGN's dynamic signature verification looks at a number of other parameters, including the time it takes to write the signature, the number of times the pen is raised, the pressure used by the hand and a few other things related to the act of signing your name. Couple this signature verification with the facial recognition I mentioned in the July 20 column and it would appear that passwords will become a computer relic, something to tell the youngsters about along with punched paper tape and 5.25-in. floppy disks.

If there's anyone else I've wronged or anything else I've neglected to mention, let me know, and I'll correct it all next August.

*Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.*

## Tip of the week

*For you NetWare 4.1 diehards, Novell has listened to you. Slipped virtually unnoticed into the announcement of NetWare 5.0's pricing and availability was the brief statement that Novell will release a year 2000 fix for NetWare 4.10 before year-end (keep your eye on www.novell.com/year2000). No need to upgrade to 4.11 (although you really should consider NetWare 5.0). It seems some vendors do respond to users' requests.*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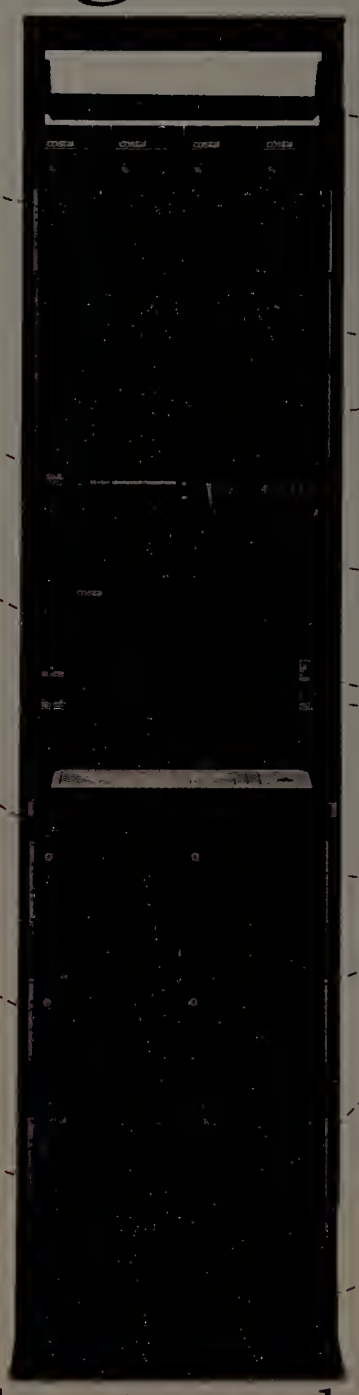

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SPECIAL FOCUS

*NT 5.0 planning*

# Prepping for NT directory

*New technology requires a lot of grunt-work preparation, users say.*

*By John Cox*

The ongoing delays of Windows NT 5.0 are fast becoming a blessing for IS professionals facing Year 2000 software fixes. In fact, many of these folks now say they won't deploy NT 5.0 until later in 2000 or 2001, even if Microsoft manages to hit a mid-1999 shipment date.

In spite of this, NT managers now are starting to grapple in earnest with NT 5.0 migration issues. That's because the NT 5.0 Active Directory Service (ADS) will require some major changes within your network in order to achieve its full impact — becoming a clearinghouse for all kinds of user and device information.

ADS will be like a super Yellow Pages for the network — a hierarchical master database of user names, identification numbers and access privileges, as well as information about NT servers and workstations, systems and application software, and so on.

Just as important, managers will be able to write rules, called policies, that govern the relationships among the entries. So for example, when a newly hired employee's name and other data is entered into the human resources database, it's passed to ADS. There policies execute, and based on the employee's title, he or she will be assigned a set of access permissions to applications and files, and possibly even bandwidth priorities.

All of this is a major change from the current structure in NT 4.0. And shifting from one to the other may pose major headaches for large customers. As a result, many customers have already begun forming teams to create migration plans to make the transition to ADS as smooth as possible.

"In the spring, we had Microsoft do a supportability study of our current and planned [NT] domain networks," says Dan Abrams, project manager for NT domain reconfiguration at Southwestern Bell Communications Directory Operations. "We wanted to be sure we could merge two big NT domains and not shoot ourselves in the foot for NT 5.0. We didn't want to go down a blind alley."

Others are following a similar path. "We're looking at our current NT 4.0 domain model with an eye to consolidating it," says Joe Brand, lead LAN analyst with Nabisco in Parsippany, N.J. "We're putting together a schematic diagram of what an NT 5.0 net would look like and how we'd change the current domain structure."

A related issue is creating naming conventions for the network that match with the way the business is organized, whether along business units or geographical lines. "We'll be able to design our net around our business, rather than the other way around," Brand says. "We need to decide how our international operations will fit into this new domain structure. So we'll do a case study to find out how the business operates today and how it plans to operate in the future."

### THE ROAD AHEAD TO NT 5.0 ADS

**How to plan for Microsoft's upcoming directory:**

1. Simplify existing NT 4.0 domain structure and outline steps for shifting this to NT 5.0.
2. Revise DNS infrastructure.
3. Create consistent naming conventions for NT systems.
4. Plan for NT 5.0 training sessions and gear up staff resources for directory-related work.
5. Determine how ADS replication over WANs may affect network bandwidth.
6. Consider bringing all current NT systems to same NT 4.0 version and Service Pack release.
7. Set up NT 5.0 lab for testing ADS, and Lightweight Directory Access Protocol support.

Companies that have already organized a simplified NT domain structure are in good shape for moving ahead. "We've got one master domain, the rest are resource domains, and it's pretty straightforward," says Angel Cortes, senior systems analyst at Nordstrom, a Seattle-based retailer. "We don't think the migration will be a problem, based on what we've heard from Microsoft so far."

Simplifying the current NT domain structure is important, but it's not enough. A lot of work will still be required during the migration process, and users need to plan ahead for that. "Repermissioning an existing NT 4.0 Access Control List in NT 5.0 will be a long and tedious job," says Kevin Chou, a consultant in this field, currently working with a big New York brokerage house. "This is just one example of what has to be done. And everything is keyed off this. There's no easy way at this time to move this stuff."

One of the biggest issues concerns Domain Name System (DNS), which enables computers on TCP/IP nets to find and connect to each other. Today, NT doesn't use DNS directly but relies on the Windows Internet Naming Service software from Microsoft to relate DNS entries to the NetBIOS names NT relies on, according to Randall Kennedy, an analyst with Competitive Systems Analysis, a consulting company in Danville, Calif.

ADS will use DNS and, more important, dynamic DNS, a variant that lets systems on the network update DNS records with new data as they connect to the net. Today, DNS changes have to be manually entered into the database on one or more DNS servers.

At Southwestern Bell, a review of the existing host names for computer systems found that many were incompatible with DNS naming conventions. "We had a couple of thousand workstations and a lot of our servers that didn't have standard DNS names," Abrams says. All had to be renamed.

NationsBanc in Chicago is in the process of creating its DNS infrastructure, says Richard Shope, manager of PC technology and planning. The new structure will include new dynamic capabilities so DNS entries can be updated automatically. DNS is also the core of the bank's higher level enterprise directory based on the X.500 standard.

At NationsBanc, as in nearly all other companies that use DNS, the DNS servers are Unix computers, in this case running the HP-UX operating system. "We've created an NT domain under this Unix-based DNS," Shope says. "This adds a layer to our directory tree, but it lets us manage the NT [domain] independently. The Unix administrators manage the Unix systems and the directory services above that."

Not surprisingly, according to Competitive Systems Analysis' Kennedy, many companies are reluctant to entrust DNS services to NT systems instead of the traditional DNS hosts — Unix servers. That reluctance is due, at least in part, to the fact that NT "doesn't stay up like Unix does," Kennedy says. "Microsoft wants NT 5.0 to handle everything on the net. But a lot of companies will resist this. If DNS goes down, nothing works." ■

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[1] According to an independent study by the Dell'Oro Group.

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## Briefs

■ **IBM** *last week added* **TCP/IP multicast and Novell IPX support** *to its S/390 Open Systems Adapter 2 (OSA-2).*

*OSA-2 lets users attach LANs directly to a mainframe. TCP/IP multicast saves on bandwidth and can deliver multimedia information quickly.*

*For Novell users, IPX support means they can enhance performance by directly linking with the mainframe without having to deploy a separate gateway.*

*IBM also says the Novell support is ideal for enterprises looking to consolidate existing Novell NDS servers on the S/390. The new features will be available Sept. 30. Pricing was not available.*

*✆ IBM: (800) 426-4968*

■ **Cisco Systems** *last week announced the availability of* **Layer 2 Tunneling Protocol (L2TP) within Cisco IOS software.**

*Cisco says the CiscoAssure policy-based network services of IOS, initially targeted at private enterprise networks, can be used for virtual private network (VPN) applications.*

*CiscoAssure policies can differentiate VPN service levels and prices, as well as provision, bill and manage VPN services, Cisco claims.*

*The availability of L2TP lets service providers deliver secure and prioritized VPNs to customers that require communications with mobile users, telecommuters and small, remote offices over dial, ISDN, digital subscriber line, cable and wireless technologies, Cisco says.*

*L2TP is a standard network protocol that combines Cisco's Layer 2 Forwarding protocol and Microsoft's Point to Point Tunneling Protocol.*

*Cisco IOS with L2TP support began shipping last week. Cisco has been offering IP Security in IOS since April.*

*✆ Cisco: (408) 526-4000*

*In-Site*

## Hospital's ATM WAN untangles T-1 snarl, reduces costs

**By Tim Greene**
*Chicago*

T-1 lines at Rnsh Presbyterian/St. Luke's Medical Center were piling up so fast that the wiring closet was starting to look like a snake pit.

With hospital medical offices moving to new buildings and more private practices tapping into hospital network resources, the medical center was ordering a new T-1 every two weeks, according to Prasad Ravi, director of telecommmnications at Rush Presbyterian/St. Luke's.

By purchasing a remote access switch from Sentient Networks and bargaining shrewdly with phone companies, Ravi got rid of the cable snarl by consolidating the T-1s onto T-3 pipes.

He invested $39,000 in a Sentient Ultimate 1200 WAN access switch that can handle two T-3s — the equivalent of 56 T-1s — leaving the hospital with room to grow. The price was about half the cost of the other alternatives he considered.

The hospital runs ATM over 40 T-1s to private medical groups and hospital buildings. The T-1s were terminating on FORE ASX 1000 switches in the hospital data center.

Terminating all the lines on the FORE switches was expensive; six-port T-1 cards cost $12,000 each. The cards ate up so many switch slots that the hospital was going to have to buy more switch chassis at a cost of $35,000 to $40,000 each, Ravi says.

**Prasad Ravi** *found a way to reduce cable clutter for his ATM network.*

"Every slot taken up by a T-1 card is a slot we could have used internally for the LAN," Ravi says. "It's much better to use those ports for OC-3 pipes than for T-1 pipes because you are wasting the ATM switching capacity of the chassis."

Ameritech suggested aggregating all the T-1s onto T-3 lines, and Ravi cut a deal to pay only for the bandwidth actually used on the T-3s. The hospital pays a flat fee per T-1 that is less than the $600 tariffed rate for a long-range T-1 service. The flat fee is also better than the $220 minimum it would cost for a very short T-1, Ravi says. Part of the deal with Ameritech requires that Ravi not reveal the exact price of the flat fee.

Ravi managed to negotiate the agreement with Ameritech because he played Ameritech against Avenew, a competitive carrier that had been providing the hospital with T-I lines.

Ameritech suggested terminating the T-3 lines on a Cisco router already owned by the hospital. But that would have cost about $47,000 for a DS-3 router card that didn't support ATM. Ravi rejected the proposal.

Ameritech then suggested that the medical center buy a Telco Systems multiplexer that would take in one T-3, demultiplex the traffic into 28 T-1s, and plug the T-1s into the FORE ATM switches.

That proposal would have cost $85,000, and still would have mandated wasting valuable ATM switch fabric by using the T-1 cards. Ravi rejected that proposal, too.

Then, four months ago, Ravi heard about Sentient and told the company about his problem. Sentient suggested its Ultimate 1200, which can terminate a T-3 and switch the traffic through to a single OC-3 port occupying one slot on a FORE switch. The hospital bought the Ultimate box for $39,000.

In addition to the T-3s, the Ultimate 1200 handles a group of 56K bit/sec and 64K bit/sec lines running PPP from small remote sites.

The WAN access switch converts a PPP session to an ATM permanent virtual circuit and puts it through to a Cisco router on the LAN.

"We have less equipment to maintain, less space taken up in the data center and fewer cables running around. And we get all the functionality that we need," Ravi says. ■

MILLENNIUM PICTURE GROUP

## IBM tying Netfinity servers directly to mainframe

**By Marc Songini**

IBM is building a fat pipe between the mainframe and its Netfinity Windows NT server.

The company next month will announce the Netfinity ESCON Channel Adapter, a card that will let customers link servers directly to mainframe resources, providing high-speed access to Big Iron databases and applications.

Enterprise Systems Connection (ESCON) is IBM's 17M byte/sec fiber-optic mainframe channel connectivity technology. By channel-attaching the Netfinity server, users no longer need a gateway device to connect the server to the mainframe.

The two-port, Reduced Instruction Set Computing-based Netfinity ESCON adapter is built buy Bus-Tech, a mainframe channel connectivity company based in Burlington, Mass. Up to four of the adapters can be installed in the PCI slots on the Netfinity server.

The adapter also supports IBM's MultiPath Channel Plus (MPC+) mainframe channel protocol. MPC+ enables high-speed, high-volume traffic among mainframes and downstream channel-attached servers, routers and switches. IBM says MPC+ technology can improve channel throughput by 40% and reduce mainframe cycle utilization by 60% over older channel protocols.

Other ESCON adapters sold by Microsoft, SPX Corp. (formerly General Signal) and others do not support MPC+, IBM says.

The Netfinity ESCON Channel Adapter will be available in October for about $10,000.

✆ IBM: (800) 426-4968; Bus-Tech: (800) 284-3172


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INTERNETWORKING MONITOR

# 'Net QoS hurdles cripple enterprise VPNs

Virtual private networks (VPN) are supposed to give us the ability to use the Internet as an enterprise-quality WAN without the expense or the management headaches of a private intranet.

Yet there are a number of issues that must be answered before VPNs become a serious alternative to large, meshed, leased-line intranets. Perhaps the most important issue is guaranteed quality of service (QoS).

If you are implementing or considering installing or deploying VPNs in the near future, heed this warning: Because of systemic problems with today's Internet infrastructure, ISPs cannot yet guarantee enterprise-class QoS required for enterprise VPNs.

QoS is the capability of a network to define and negotiate levels of performance, reliability and predictability between the user and the provider. If VPNs are to use the Internet effectively as a future enterprise infrastructure, they need to deliver the same levels of guaranteed service that network managers expect from their tried-and-true leased lines.

If anything, the QoS requirements would become even more stringent as customers start putting next-generation applications such as distance learning and multimedia on the 'Net. For most mission-critical applications, the cost savings from VPNs are negated if users must sacrifice QoS beyond certain limits. It does no good telling your chief financial officer you saved hundreds of thousands of dollars in line charges, only to have to turn around and say the company lost several times that in revenue because the average sales transaction time doubled due to substandard Internet performance.

Andrew Hacker

Recognizing the importance of QoS, most VPN hardware and software vendors are already emphasizing the QoS aspects of their products. A common technique is to offer some form of traffic shaping to help prioritize important traffic over less important traffic before it hits the Internet.

The problem is that a single VPN connection may travel over several ISP networks. Unless they all agree to provide, say, a uniform Priority 1 service, the best service level for that connection is limited to the ISP providing the worst service level. Even if ISPs were to attempt end-to-end QoS, it is a tough task because there is no standard to implement end-to-end QoS.

Ultimately, guaranteeing QoS is a task for future public network providers. ISPs and standards bodies are already building infrastructures and enhancing Internet protocols to support QoS, such as GigaPop from the Internet 2's QoS workshop. Once such standards are in place, ISPs can standardize on procedures for negotiating interprovider QoS. Until then, VPNs will remain unsuitable as an alternative to today's enterprise intranets.

*Andrew Hacker is a senior engineer/analyst with The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, ajh@tolly.com or www.tolly.com. Hacker is filling in for Kevin Tolly, who is on vacation.*


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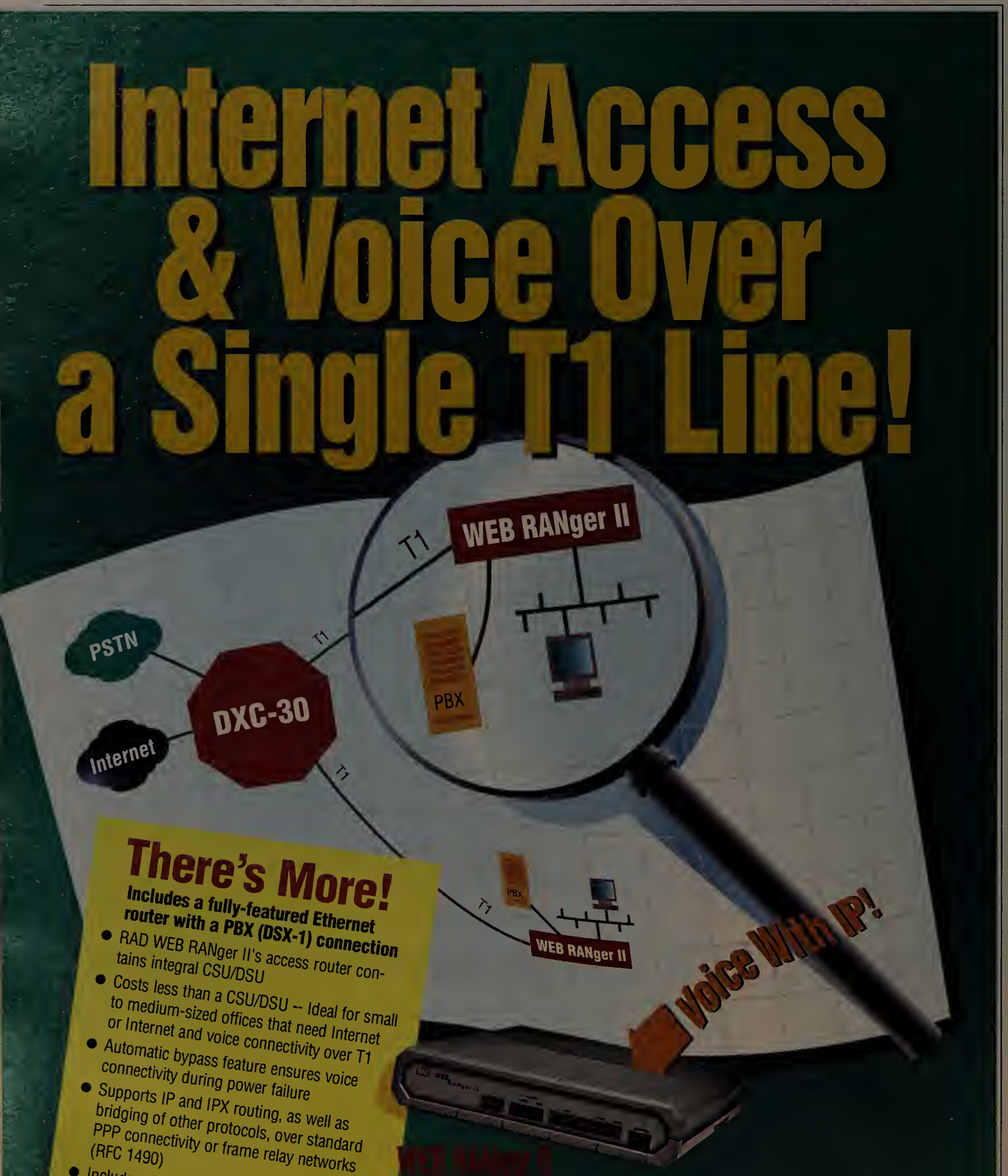


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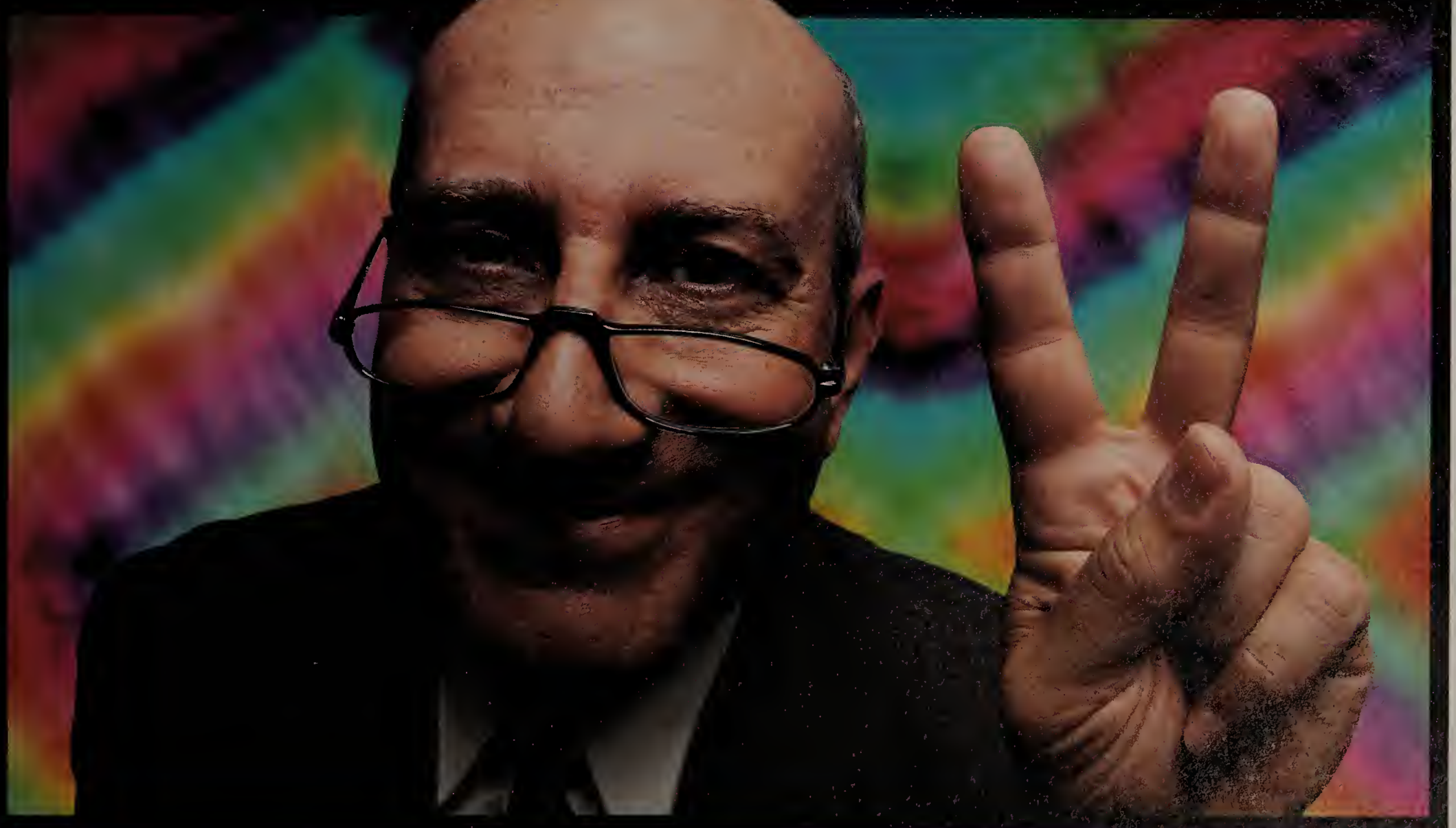

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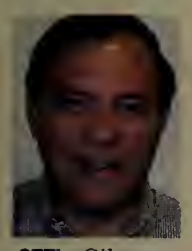
## Briefs

■ **GTE Internetworking** *has announced that* **Charles Gibney is the new president of business services** *at the ISP. Paul Gudonis, who was promoted to president after George Conrades stepped down on Aug. 1, most recently held this position. Gibney comes to GTE from Cable & Wireless, where he was senior vice president of international and corporate business. GTE Internetworking also said Paul O'Brien would be the new vice president and general manager of the company's IP telephony services business unit.*



**GTE's** *Gibney*

■ **@Work,** *the Internet access business service division of @Home Network, last week* **introduced Web hosting services.** *@Work is offering customers a shared Web hosting service based on Sun servers. The service promises 24-7 management and monitoring, and CryptoChannel Secure Sockets Layer-based encryption. The ISP will also offer customers @Work WebHosting. The service is available now for $50 to $500 per month.*

*✆ @Work: (888) 988-3675*

■ **US WEST Enterprise Networking** *announced customers will be able to* **integrate their voice, video and data communications** *over dedicated IP, frame relay and ATM connections. US WEST is using Cisco Systems 2600 and 3600 routers and MC3810 multiservice access concentrators at customer premise sites to support the new services. US WEST is also deploying Cisco's BPX 8600 switches throughout its network to support the services.*

*✆ US WEST Enterprise: (800) 328-2879*

# Sparks fly over bandwidth shortage

**By David Rohde**
*Charleston, W.Va.*

A shortage of high-capacity bandwidth in West Virginia has led to a nasty fight among major carriers over how widespread the problem is — and who's to blame.

Delays in obtaining long-distance T-1 and T-3 lines are threatening the expansion of West Virginia's education network and discouraging companies from locating call centers in the state, Bell Atlantic said in a recent complaint to the Federal Communications Commission.

As a solution, Bell Atlantic is asking the FCC to break precedent and allow it to provide long-distance circuits across the state and to neighboring states.

In response, MCI and WorldCom conceded they are suffering bandwidth shortages in West Virginia but claimed the problem is concentrated in only one part of the state and will be resolved this fall.

AT&T is taking a more militant stance. It denies it is suffering any shortages and charges that Bell Atlantic's complaint is a "cynical ploy" to obtain regulatory authority to carry long-distance traffic. Yet some users report they are suffering delays in getting AT&T circuits.

***"What we have here are six-lane superhighways in West Virginia feeding into two-lane country roads leading in and out of the state."***

**Dennis Bone,** president, Bell Atlantic-West Virginia

At the center of the controversy is a project called WVNET, which provides Internet access for schools, colleges and state agencies around West Virginia.

Until recently, WVNET provided Internet connectivity via a 22M bit/sec link from UUNET that stretched from Morgantown, W.Va., to Pittsburgh. But in January, WVNET awarded a contract to Bell Atlantic Internet Solutions (BAIS) to more than double capacity via two 34M bit/sec connections, one in Morgantown and one in Charleston, the state capital.

BAIS obtained the Charleston facility from a power-company affiliate but could not get the Morgantown link for six months until WorldCom offered facilities, according to Bell Atlantic. As of last week, the WorldCom link was still not up.

Dennis Bone, president of Bell Atlantic-West Virginia, says his company has built numerous SONET facilities across the state to provide local bandwidth not matched by long-distance facilities. "What we have here are six-lane superhighways in West Virginia feeding into two-lane country roads leading in and out of the state," Bone says.

The issue goes beyond the WVNET Internet connections, says Matthew Brown, a manager in the state government's Information Services and Communications Division. AT&T missed a scheduled installation date by 28 days for a T-3 link, and other carriers have let schedules slip for a variety of facilities.

Likewise, the Civic Development Group, a West Virginia call center and telemarketing outsourcing company, in mid-June ordered 14 T-1s from AT&T and WorldCom for a new call center in Clarksburg, W. Va. Only seven were installed by mid-July, and the rest are still not in place, says Eric Shaw, Civic Development's Clarksburg site manager. ■


**Get more online:**

- **A look at how RBOCs will step up DSL deployment.**
- **A report on the controversy surrounding the FCC's broadband deployment plan.**

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# Five cities got Rhythms

**By Tim Greene**
*Englewood, Colo.*

No one ever told Rhythms NetConnections that breaking into the high-speed digital subscriber line (DSL) services market would be easy.

Despite delays caused by negotiations with established local carriers and the difficulties of setting up a nationwide network, the carrier will this year roll out services in five cities — Boston, Chicago, Los Angeles, San Diego and San Francisco.

**PROFILE: RHYTHMS**

RHYTHMS

**Based:** Englewood, Colo.
**Founded:** 1997
**Funding:** $30 million initial funding from Kleiner Perkins Caufield & Byers, Enterprise Partners, The Sprout Group and Brentwood Venture; $150 million private placement.
**Services:** Dedicated broadband access using DSL technology.
**Employees:** 126
**Competitors:** Covad, RBOCs
**Fun fact:** CEO Catherine Hapka and Vice President of Sales Gloria Farler are both percussionists, hence the name Rhythms.

Backed by $180 million in investment capital, Rhythms offers DSL services — at speeds from 256K to 7M bit/sec — aimed at business customers.

The DSL lines connect customers with either an ISP or a corporate network. Rhythms installs the necessary hardware and software, including modems and an Ethernet network interface card for the customer PC. Rhythms also connects the DSL circuit.

Hutchins Associates, a publishing industry service bureau in San Diego, uses Rhythms' DSL to access the Internet and to connect two sites that are about a mile apart, says Linda Hutchins, the company's network administrator.

The service is less expensive than a T-1 but offers near-T-1 speed. It runs over existing telephone wiring in the Hutchins building, she says.

One key challenge in setting up the network was negotiating with the regional Bell operating companies. Rhythms has to deal with them because the RBOCs own the local telephone lines that DSL runs over. "What you have is a willing buyer, who is us, and a not-so-willing seller, which is the RBOC," says Eric Geis, general manager for Rhythms' western region.

It can take five to six months and $50,000 just to negotiate an interconnection agreement with an RBOC. Then it costs between $30,000 and $100,000 to set up space in an RBOC switching office to place Rhythms' network hardware.

Rhythms chooses cities to enter based on the number of businesses located there, the number of remote workers they employ and the number of LAN segments they represent. ■

EYE ON THE CARRIERS

# IP convergence and your telecom contract

IP voice/data convergence naysayers have it easy. On the surface, the phenomenon seems easy to debunk.

The popular press spent the first half of this year glorifying the new IP telephony providers because they could carry phone calls for "only" 7.5 cents per minute. But everyone in the trenches realizes most corporations are already getting regular telephony for less.

Besides, I've yet to hear of a network manager handing a card to his CEO and saying, "Punch in these 31 numbers to reach our new Internet carrier, and then talk slowly and loudly to the other CEO so he knows we're offering $10 million, not $10 billion, in that takeover deal."

So can you sit back and let convergence hype just roll over you until it goes away? Not by a long shot. There's real action in voice over IP today. And the real action has nothing to do with numbers like 7.5 cents per minute. Move the decimal point over and it's more like making calls for 0.75 cents per minute by avoiding the tolls of the legacy carriers and the newbies.

Users are finding that it doesn't take an announcement of voice-over-frame relay services from AT&T, MCI and Sprint to get the convergence market going. For you, the real hang-up could be in something much closer to home: your telecom contract.

For years carriers have promised to shave rates just a little more if you sign a long-term voice contract with a rising minimum expenditure each year of the contract. But go to move your voice traffic to frame relay or ATM and you may suddenly find you've violated the contract because your telephony spending will have shrunk.

David Rohde

So if you have any interest at all in voice/data convergence, here are some talking points for your next carrier negotiation, which I hope is coming up soon:

1. The major carriers now all want to be your voice and data carrier. Fine. Tell them the key to your business is the data network. Any carrier that prevents you from adding features to your enterprise data network because the contract obligates you to spend X bazillion dollars on voice tolls could be replaced.

2. Watch for extra costs such as premiums for souped-up, voice-enabled frame relay virtual circuits that supposedly get priority over other circuits. Those fancy virtual circuits are all well and good, but many experts believe the key is prioritization schemes in customer premise equipment. Don't default your WAN design and traffic modeling to the carrier.

3. Finally, tell carriers that preset minimum annual expenditures that rise each year of a multiyear contract don't make much sense anymore — even without IP convergence. Here's the long-distance carriers' dirty little secret: By federal mandate, every July 1, the access charges they pay the local exchange carriers go down. So quite possibly you ought to be paying less, not more, even if your voice traffic never migrates.

*Rohde is a senior editor with* Network World. *He can be reached at drohde@nww.com.*


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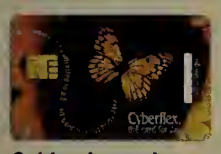
## Briefs

■ *Austin, Texas-based* **Schlumberger Smart Cards & Terminals** *said it is now shipping the Java-based* **Cyberflex Open 16K smart card,** *so named because of its programming capacity.*

*The firm also is shipping the $495 Schlumberger Cyberflex Development Kit for building applications that use Cyberflex Open 16K, which is based on the Java Card 2.0 API.*



**Schlumberger's** *Cyberflex Open 16K smart card.*

*The development kit supports a PC/smart card interface, an application processor, a smart card simulator and a smart card manager.*

*✆ Schlumberger: (512) 351-3000*

■ **Netscape** *recently announced a new software package,* **Process Manager,** *which lets developers build Web-based applications that handle processes that normally take place over the phone, e-mail and in person.*

*Through integration with Enterprise Server and Directory Server, Process Manager enables secure communication, coordinated workflow and sign-off on tasks such as contract negotiations, job bidding and project management.*

*A starter bundle will cost $9,995 and include 100 client licenses, two developer seats, 100 Directory Server user licenses and Enterprise Server software.*

*Additional client licenses and developer seats are expected to be priced at $75 per client and $1,495 per seat.*

*Deployment to an extranet is slated to start at $49,500 per server.*

*Currently in private beta, shipment is scheduled for the fall.*

# Hospitals stitch together critical intranet

**By Ellen Messmer**

A half dozen large Boston-area hospitals, which already share IT resources, are now setting their sights on the World Wide Web.

The group is hard at work building customized Web applications for single sign-on, easy access to patient records, and Web-based paging for physicians and other medical personnel who always seem to be on the go.

The hospitals — Massachusetts General Hospital (MGH) Brigham & Women's Hospital, and Newton-Wellesley Hospital among them — are building dozens of these Web applications in-house with the help of Caché from InterSystems Corp. The applications, based on the Caché database management system, are replacing the hospitals' older and less flexible MGH Utility Multiprocessing System databases. Caché is a Web-enabled object-oriented relational database and development environment.

**Monbouquette** *helped MGH and other hospitals with their hospital directories.*

The benefits of Caché are already being realized. "One of our latest projects, a directory application built in-house, gives you a way to rapidly discover phone numbers for all the people who are moving around the different hospitals on any particular day," says Kathyln Monbouquette, director of telecommunications and operations at Partners Healthcare System, which provides IT services to the group of area hospitals.

The hospitals now have about 30,000 Web-ready desktops that authorized people can use to get at Caché-based database applications. The number of desktops is expected to climb to 50,000 by year-end. The six hospitals are connected by T-1 and T-3 lines, or OC-12 SONET rings.

### Intranet stat!

Using Caché, the IT team at Partners Healthcare System set up a centralized server that contains metadata, which describes what is on the Web servers on the hospitals' intranet.

A dozen Caché database servers hold information such as directories listing thousands of personnel, schedules, online records and files, and phone and pager numbers.

Users can authenticate their identity from any Web desktop and gain access to authorized resources.

The hospitals have about 100 Caché applications running, the latest one providing a way to page medical personnel via the Web instead of by phone.

"To alert a physician about abnormal lab results, for instance, you would just go to the Web directory and click on 'page,' and it will do it for you," Monbouquette says. ■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# Firewall market blazing, up 143%

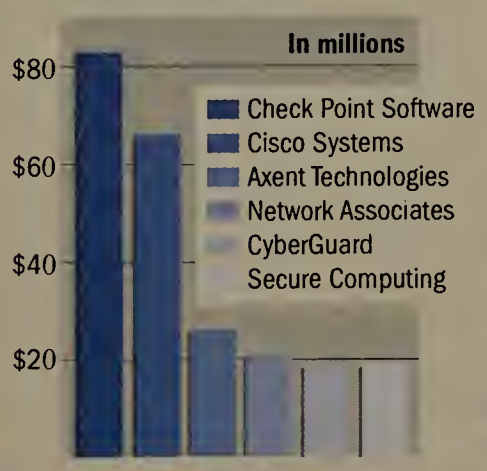
*More companies on the Internet means more firewalls.*

**By Phil Hochmuth**

Internet firewall vendors experienced major growth in 1997, according to a report published last month by Framingham, Mass.-based International Data Corp. (IDC). The market for firewalls more than doubled last year, growing from $145.6 million in 1996 to $353.5 million — an increase of 143%.

The main factor that caused the firewall market to balloon was the increase in companies connecting to the Internet. Also, more companies began using the World Wide Web, not just for e-mail and Web browsing, but as a core business tool.

**TOP COMPANIES IN FIREWALL SOFTWARE REVENUE**




**Companies with $5 million to $10 million in firewall software revenue:**

- Compaq
- Computer Associates
- Elron Software
- IBM
- Microsoft
- Novell
- Sun

### Safety first

With more and more business being conducted on the Web, the need for Internet security became a top priority. As services such as online product ordering and product information databases became more sophisticated, security measures followed suit.

According to the IDC report, Check Point Software Technologies retained its title as the top firewall vendor and was clearly the market leader last year with $83 million in sales. Cisco Systems followed in the No. 2 spot with $65.7 million in sales.

Axent Technologies, which acquired Raptor Systems, ranked third at $26 million, trailed by Network Associates, now in fourth place with $21 million. In fifth place, CyberGuard and Secure Computing ranked with about $19 million each in revenue.

### Firewall underdogs

Several of the larger software companies last year ended up at the lower end of the firewall market. Microsoft, Novell, IBM, and Sun all garnered $5 million to $10 million in firewall sales.

Other vendors in the $5 million to $10 million range included Elron Software, Computer Associates and Compaq, which now owns Digital's Alta Vista firewall.

IDC forecasts the firewall market to continue to grow over the next few years, with revenue reaching $1.2 billion by 2000, and $1.8 billion by 2002. ■

'NET INSIDER

# How many 9s are enough?

If there is one thing telephone people are insistent on, it is reliability — at least in their demands on equipment. The common belief among phone people who are trying to build data networks is that equipment needs to be "five nines" (99.999%) reliable in order to be useful in a network they want to build. I think they are wrong to want this level of reliability in data networking equipment, and I fear their insistence on this level is inhibiting their deployment of useful data networks.

It will be interesting to see if they maintain this belief in the future, in which case they will have to compete against other providers for customers. It is currently easy for the traditional phone company to insist on reliability at great cost because it exists in a world where increased cost means increased revenue being authorized by the local utility commissions.

But utility-commission-distorted economics aside, I think the problem is that the people who are insisting on five nines do not understand data networking.

Back in 1964, Paul Baron, then at Rand Corp., produced a series of articles proposing the idea of packet-switching nets. (The papers were recently posted online at www.rand.org/publications/RM/baran.list.html.) Baron was working at a time when there was considerable worry about the destruction of the U.S. communications infrastructure by enemy action. He proposed a network design that would survive large-scale node or link destruction. His design was for a distributed network with many small cheap packet switches and many redundant links between them instead of the then-common network design that had a few large phone circuit switches. He showed that when reliability was measured end to end, a distributed net would exhibit very high reliability even in the face of the failure of a number of the switches or links in the network. He concluded, "From the user's viewpoint, the system appears to be virtually noise- and error-free when handling data." He was describing the current Internet architecture long before its time.

Scott Bradner

A key reason to use a distributed network is to minimize the reliance on any single network component. The network will route around link or switch failures. In this type of environment, five nines reliability is overkill. But it's not a surprise phone types think in terms of the need for extreme reliability — they generally don't have distributed networks with redundant paths.

There are places in many ISP networks where redundancy is not as rich as it might be — the link to the customer site for example. And in many ISPs, the level of traffic is such that routing around a failure will cause congestion and data loss. But Internet-style networks are not the same as telephone-style ones, and the reliability demanded from each component should not have to be as high because the net will cover up for a lack of reliability due to redundancy in most cases. Less expensive, reasonably reliable switches may not result in less reliable service to the customer.

Disclaimer: Harvard spends more time understanding the reliability of people than electronic components, so the above postulation is mine.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.*

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**We use Microsoft's Routing and Remote Access Server (RRAS) to connect two sites. We've got three Hayes 56K-bit/sec modems talking to a stack comprising three of the same type of modem. The problem is that after a day or so one of the modem pairs drops off. Then, within a week, another pair does, too.**

**When the one remaining pair of modems finally disconnects, the RRAS connection redials itself and we're back up to a full three-to-three connection. Alternatively, I can go to a RRAS server, disconnect it and then reconnect to get a full three-to-three connection.**

**Do you know of a way to get RRAS to redial after any pair of modems drops off or to keep the three pairs alive for a longer period?**

**Via Network World Fusion**

Connecting modems to a RRAS server via serial ports could lead to this problem. I recommend using a multiport communications board from Comtrol.

This board has an onboard processor that eliminates the need for the server CPU to service the modems attached to it. If you are already using a board similar to this, check with the manufacturer to see if it has newer drivers available.

Unless you have someone at each server when one of the modems drops connection or catch a message in the event log pointing you in the right direction, you might want to consider changing out one pair of the modems to see if the problem is modem-related.

You also might want to check a couple of Web resources. Go to Microsoft's support site at http://support.microsoft.com for a technical article on using Remote Access Server dial to reestablish a dropped connection.

# Access specification opens WAN ATM door

**By Michael Rubin and Jack Yang**

Organizations using ATM for wide-area networking have one thing in common: The more efficiently they can employ their leased lines to consolidate campus traffic before it hits the WAN, the better.

Inverse Multiplexing over ATM (IMA) is one of the tools for that job. IMA is an access specification approved in 1997 by the ATM Forum as a User-Network Interface (UNI) standard that is now being implemented in switches, routers and other edge devices.

IMA lets network managers gain the bandwidth and quality-of-service (QoS) advantages of ATM — in the campus backbone or en route to carriers' ATM switches, for instance — by fanning out ATM cells across multiple T-1/E-1 lines. T-1s are typically inexpensive and in place; with IMA, organizations can combine them as needed, avoiding the cost, complexity and potentially wasted capacity of higher bandwidth T-3/E-3 lines.

IMA is derived from a circuit-switching technique called inverse multiplexing, which became a popular alternative to time-division multiplexing (TDM).

TDM enabled multiple streams of user data to share a common medium — a T-1 line — but maximum bandwidth for any stream was limited to the bandwidth of the individual line. Inverse multiplexing solved the problem by pooling the bandwidth of several T-1/E-1s into a single larger pipe. TDM accomplished this by spreading high-bandwidth traffic across multiple T-1/E-1s, synchronizing and time-stamping the traffic, then merging traffic back at the receiving end.

IMA, which can be implemented on private leased lines or offered as a carrier ATM service, uses the same approach. It combines multiple T-1/E-1 circuits (1.544M bit/sec and 2.048M bit/sec, respectively) into one logical ATM pipe. Unlike the vendor-proprietary TDM inverse multiplexing, IMA ensures interoperability among IMA-compliant products.

In operation, IMA-equipped devices perform the normal ATM UNI functions of segmentation and reassembly of larger frames and packets into ATM cells, and initiate virtual circuit connection setups across the network.

An IMA Control Protocol then establishes the inverse-multiplexed UNI by aggregating traffic from the campus links into one physical-layer medium and distributing ATM cell streams over multiple T-1 circuits. Cells from the IMA access concentrator are placed on the T-1 circuits via a cyclic round-robin approach. IMA devices also exchange control information as a means of monitoring link status and ensuring connection quality.

Because the IMA ports on the receiving switch require a steady stream of cells to correctly recreate the original stream, the sending device introduces filler cells whenever there is a lull in traffic to keep the round-robin process synchronized. At the same time, to reduce bandwidth consumption, IMA removes any idle or unassigned cells from the access stream and reinserts them at the network edge.

Unlike TDM inverse multiplexing, IMA does not have to be supported all the way across the WAN. IMA runs from the user demarcation point to the first carrier ATM switch, or to the nearest ATM backbone switch in private networks. At that point, traffic is demultiplexed and carried on its way through the wide area by ATM's conventional virtual circuits.

If the receiving station uses IMA, the same procedure happens in reverse between the network edge and the IMA access device, ending in individual traffic streams on the LAN.

### Evaluating IMA implementations

For organizations with high-bandwidth campus traffic, IMA has the potential to reduce complexity by letting net managers consolidate LAN, PBX, legacy data and video circuits via ATM. Campus backbone complexity is reduced and costs are controlled because the organization pays only for the physical capacity it needs.

And as a carrier service, IMA lets carriers offer a wider range of broadband-access price points — this ultimately benefits the net manager as well as the carrier.

But users should be aware that IMA vendor implementations will vary. For example, fault tolerance and the ability to add/drop gracefully when one of several links fails is a feature not all hardware will support.

In general, performance will favor IMA access concentrators that take full advantage of ATM's sophisticated capabilities for traffic management, fault tolerance and legacy equipment interoperability through ATM Forum standards. IMA access concentrators should be able to manage bandwidth to provide QoS for voice and video, while shaping data traffic to optimize network utilization.

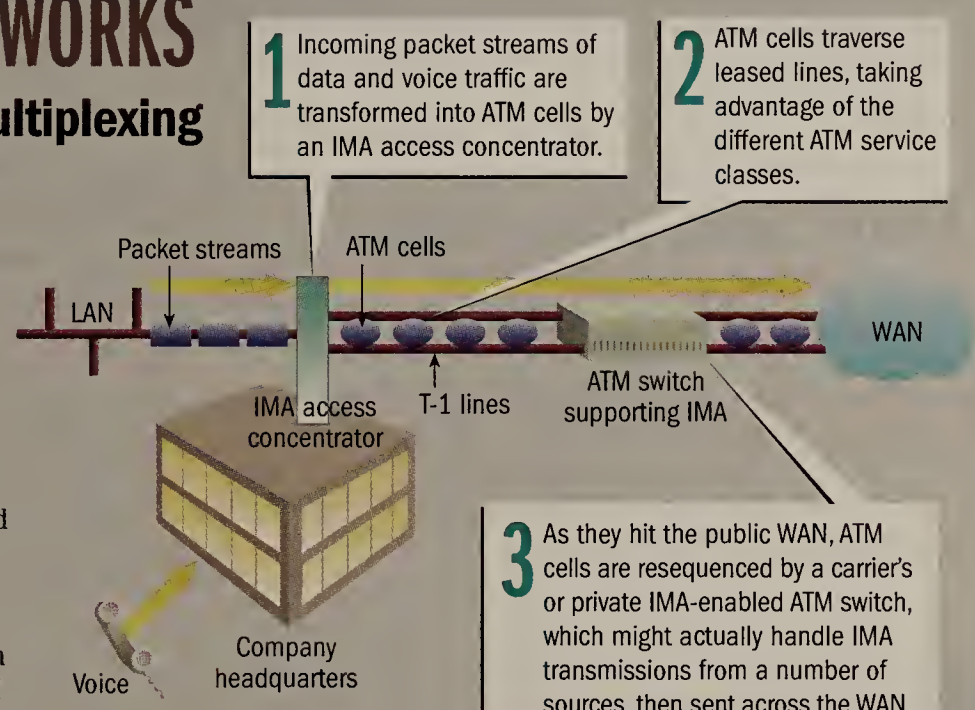
Finally, IMA product lines should be offered in a range of scalable configurations. This will pay dividends in network flexibility, efficient utilization of WAN links and optimal per-site return on investment.


*Rubin is director of marketing for the Enterprise Business Unit at 3Com. Yang is a product manager for 3Com's Carrier Systems Business Unit. They can be reached at Michael_Rubin@3Com.com and Jack_Yang@3Com.com.*


## HOW IT WORKS

### Inverse Multiplexing over ATM

IMA is an ATM Forum-approved access specification. Built into switches, routers and other edge devices, IMA devices combine multiple high-speed circuits into a single, logical pipe – reducing bandwidth consumption and providing ATM QoS guarantees.



## EDITORIAL *insights*

# Challenge Part II: This time for the Layer 3 switch vendors

Last week, I challenged some of the leading ISPs to take part in our ISP Showdown debate at Fall Internet World 98 in New York. Now I'm challenging Layer 3 LAN switch vendors to participate in the Layer 3 Switching Showdown at the upcoming NetWorld+Interop 98 conference in Atlanta. With this showdown, I'm going out on a limb, and I really hope I won't wind up regretting my decision.

When we stage one of these presidential-style debates at a major trade show, we usually invite no more than six vendors. But for the Layer 3 event, I'm stretching the roster to seven companies — a number that could be tough to control in this interactive forum. Based on discussions with readers and analysts, I'm challenging early Layer 3 market leaders Bay, 3Com, Cabletron, Extreme Networks, Foundry Networks and Packet Engines to send a CEO or chief technology officer to take part in the showdown. That's a good mix of the established vendors and the newcomers that are challenging the status quo with their Layer 3 offerings.

Now you, alert reader, have noted that's only six companies. But to that mix I'm also adding Cisco, which nearly everyone thought should be invited, even though Cisco hasn't been a major player to date in the Layer 3 arena. With its market size, Cisco will clearly have a big influence on the future of Layer 3, and readers need to know where the company intends to go. The seven companies have until Sept. 7 to confirm their participation in the Layer 3 Switching Showdown, which will be held from 10:30 a.m. to noon on Oct. 22.

In the first portion of the debate, our seven stalwarts will face tough questions from a panel of experts, including Jim Duffy, a *Network World* senior editor covering the Layer 3 beat; Esmeralda Silva, a top LAN market analyst with International Data Corp.; and Kevin Tolly, founder of The Tolly Group consultancy.

After that round of questioning, the vendor panelists will have a go at one another and then field questions from our audience.

Our goal is to help network professionals cut through all the overgrown rhetoric about Layer 3 switching and find out where it makes sense in their networks. What's more, we'll help net managers figure out which vendor's products best fit their needs.

So, Bay, 3Com, Cabletron, Extreme, Foundry, Packet Engines and Cisco, are you up for the challenge? I hope you'll all agree to take part, even though things might be easier if one of you declines.

***John Gallant, editor in chief*** jgallant@nww.com

*On Security • Winn Schwartau*

# Of DIRT and placebos: Security gets scary

Some disbelieving readers thought my recent column on Data Interception by Remote Transmission (DIRT) was a belated April Fool's joke. DIRT is no joke; it's a legitimate law enforcement tool to monitor target PCs remotely as part of criminal investigations. My concern was that a free version of DIRT eventually would hit the Internet — and it has.

On Aug. 3 — right after Def Con, the annual Las Vegas hacker convention — a group called The Cult of the Dead Cow (www.cultdeadcow.com) released the first version of a free DIRT-like tool called BackOrifice. The ostensible purpose of BackOrifice is to provide systems administrators with remote monitoring tools, including keystroke capture.

You can eradicate this first version of BackOrifice from your computer by adding this code to your autoexec.bat file:

cd\windows\system
del <alt>255<alt>.exe

(Note that you are entering ALT Character 255, which is a blank space. Do not use the space bar.)

Newer strains of BackOrifice might have different names, so this approach has limitations. Watch www.infowar.com for updates.

Now back to our regularly scheduled topic: placebo security.

Clients incessantly ask for the impossible. They want to increase security without spending money. They want to address internal and external security concerns without affecting network functionality or worker productivity. Impossible? Not with placebo security.

Placebo security involves purporting to have security mechanisms and products in place that you don't have. Worried about declining employee productivity? Try distributing the following announcement via internal e-mail: "Beginning Monday, network administration will be monitoring every keystroke employees make at their computers. In this manner, we will be able to reward higher levels of productivity as well as detect illicit computer games. Thank you for your cooperation."

Of course, no action is taken, but the warning is clear.

Similarly, placebo security can keep crime-inclined employees on their best behavior. One firm announced it had installed a detection product to stop rampant laptop theft. Despite the fact that this was a placebo protection effort, laptop thefts immediately fell from more than 20 per month to zero. Now that's cost-effective security!

For remote dial-in applications and Internet or Web pages, warnings such as the following can reduce the likelihood of hacker incidents: "Welcome to our site! As a security measure, we are now downloading a cookie to your desktop as a means of verifying your identity. If you are not found in our database and continue to attempt access, we will immediately contact law enforcement."

Or you can get more aggressive. This is a message I found on one company's network: "Your identity is not confirmed. We did not find you in our database. We are now downloading an applet that will make your hard disk unusable. Reboot immediately to prevent this from happening." A countdown clock heightened the tension.

Placebo security doesn't work everywhere or every time. But it can help ease security woes at next to no cost. On the other hand, you might find yourself in an ethical conundrum surrounding some of the methods used, and your human resources department and legal staff may have a thing or two to say.

Nevertheless, it's an option worth considering.

*Schwartau is chief operating officer of Security Experts, a security consulting firm in Seminole, Fla., and president of Infowar.Com, a leading security Web site. He can be reached at winn@securityexperts.com or winn@infowar.com.*

## MESSAGE

*Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification*

### Advice, please

Regarding Mark Gibbs' column "Get sensible about securing your intranet" (*IntraNet*, July 1998, page 18):

I manage a mid-size enterprise network of about 80 servers and 800 users. Gibbs' remark about creating an "intranet instrumentation system" piqued my interest. I would like to know more about exactly what Gibbs means by that. What does one use for this purpose?

*Thomas Arnold*
*Network manager*
*VP Buildings*
*Memphis*

# The FCC is thinking too hard

Not too many things surprised me when I joined *Network World*'s editorial staff in 1994. But one thing did, big time: the role of complexity in communications technology.

Coming from a telecom tariff-analysis firm, I always assumed complexity was necessary and even commendable. Hard problems require hard solutions. Complication equals sophistication.

Of course, I was wrong. Sure, distributed networks are complex, sometimes mind-numbingly so. But all other things being equal, the simpler, more straightforward solution wins. This is a lesson that has been lost on one of the most significant institutions in the industry: the Federal Communications Commission. That's shown in what I'll dub the Sad Saga of Section 706.

Section 706 is one of seemingly dozens of funny add-ons to the Telecommunications Act of 1996 that appear to have been tacked on as an afterthought. But unlike the others, it's not a sop to a special-interest group such as pay-phone providers or electronic-alarm makers. Instead, it sets out a laudable goal: The FCC must, within 30 months, lay out a plan to chop away at unneeded regulations slowing the deployment of broadband data services.

Knowing the 30-month deadline was approaching this month, some of the regional Bell operating companies filed petitions under Section 706 to deregulate their data services. RBOCs said they should be able to carry high-speed data across local calling boundaries even before they won general long-distance authority. And RBOCs claimed they should not have to resell their offerings — from frame relay to digital subscriber lines (DSL) — to new competitors.

If the FCC did this, the RBOCs promised, DSL lines would bloom and new IP bandwidth would spring up because RBOCs would finally have the investment incentives they needed to become serious data players.

FCC Chairman William Kennard decided the RBOCs had a point and said so publicly. Fire bells rang in the long-distance carriers' lobbying offices. Lobbyists ran over to the FCC and reminded it that RBOCs still have a powerful choke-hold on the market, a hold they might leverage with new powers.

Faced with these conflicting arguments, the FCC split the difference and came out with a monster. Basically, the FCC proposal says the following (stick with me here):

No RBOC can just offer deregulated data services. Instead, it first must set up a separate advanced-networks subsidiary. That separate subsidiary has to follow myriad special accounting rules. If it does, the RBOC can move its DSL termination equipment and other gear into the subsidiary and not offer ports to competitors. But the RBOC still must offer space in its central offices for competitors' equipment. It cannot move the copper loops to the subsidiary — those remain with the parent company and must be resold to competitors.

There's more. The FCC said the subsidiary must not offer any voice services or even integrated voice and data services. Now forget for a minute what carriers should or shouldn't do. How is the government going to stop users from transmitting voice traffic over their data networks? Is the FCC going to send the voice police to your office to see if you have voice frame relay access devices or integrated access concentrators attached to an RBOC advanced-networks subsidiary?

The five FCC commissioners congratulated themselves for "crafting" a balanced proposal. That word, widely used here in Washington, D.C., always spells trouble: It means legislators or regulators believe they have precisely defined the shape of things to come. The real reaction in the market: dismay. The RBOCs claim the proposal adds burdens instead of removing them. Long-distance carriers claim RBOCs could abuse their new rights to create a "digital monopoly." Wall Street says the proposal changes nothing. Users are confused.

What happens next will be depressingly predictable. The carriers will engage in multiple rounds of acrimonious comment letters, picking at each of the sections of the Section 706 proposal they don't like. The FCC will issue a final rule by February, probably even more complex than the proposal. Then, assuming no one sues, the proposal will finally become law. And, if all of today's indications hold, none of the RBOCs will set up the separate subsidiaries, the point of Section 706 will be lost, and a whole year and a half will have been wasted.

There's another problem with complicated proposals like this: They steal carrier executives' attention. I guarantee you that each of the five RBOC CEOs has scrutinized the proposal, talked to investment analysts about it and huddled with their legal staffs about their next moves over it. That's time CEOs could have spent with engineers and marketing executives talking about actually deploying DSL.

The FCC certainly has the right to craft painstakingly complex regulations to cover its legal obligation to implement a difficult statute. But what's the point if the regulations don't change anything in the real world? Only clear, bold steps can do that. Memo to the commissioners: Stop thinking so hard. Sometimes there is virtue in simplicity, even in Washington, D.C.

*Rohde is* Network World*'s senior editor of Carriers & ISPs. He can be reached at drohde@nww.com.*

*Gibbs replies: I would use log analyzers (any of the leading products), site analyzers (for example, Mercury Interactive's Astra SiteManager), traffic capture and profilers (such as AbirNet's SessionWall), page counters and pretty much any tool that would give me information about content use (and abuse) and user behavior. Exactly what I'd use would depend on the company, the type of information being used and the cost of using the tool.*

## No comparison to marriage

While it is true that some parallels can be drawn between marriage and outsourcing IT services (the intimate nature of the relationship, for example), I must take strong exception to the way in which your feature "In it for the long haul" (Aug. 3, page 35) considers the two to be analogous.

Several times in the article and sidebars, it was implied that dissolving a business relationship is perfectly acceptable, even normal, just like dissolving a marriage. Indeed, depending on how you read it, one can get the impression that business deals should last longer and be better than marriages.

What the author fails to take into consideration is that the premise of the two relationships is entirely different.

Outsourcing is a business deal, a contract, not (usually) a personal relationship. It is implicitly understood and actually codified in documents how things will be settled in the event the relationship sours. The deal is expected to implode at some point in time.

While perhaps in decline in modern-day society, marriage is an oath of devotion to the other partner. Marriage vows are not a contract, no matter what twisted logic is applied to justify no-fault divorce or its equivalents.

The marriage vow is a sacred thing and constitutes a willful decision by both parties to abide by every term therein contained, regardless of personal cost. I doubt your writers would treat a breach of any civil servant's oath of office as casually.

*Matthew Patton*
*Webmaster, Resource Analysis*
*U.S. Air Force*
*Arlington, Va.*

## Role playing

As always, I enjoyed Scott Bradner's column "A role for technologists in Internet management?" (Aug. 3, page 30). I have a few thoughts on the subject.

First, Bradner talks about how we should have known that the power of the Internet would slip away. Unfortunately, governments by nature do not and will not allow others to control large amounts of power.

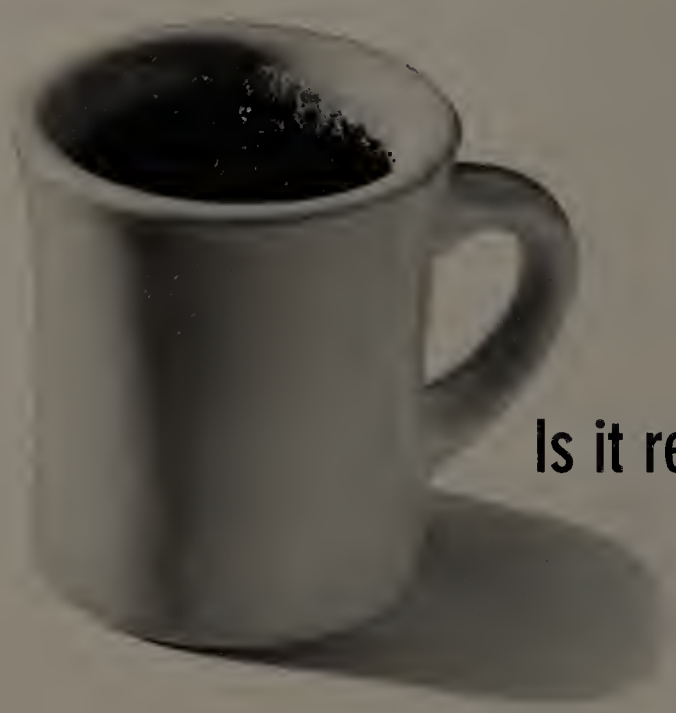
Bradner points out the amount of power that "we" control by saying that the Internet is becoming a ubiquitous connectivity device. Shame on all of us for not foreseeing that the government would get involved.

Second, Bradner talks about how the U.S. might back out of funding Internet-related projects. My first reaction is, too bad, that's pretty stupid.

However, would we not be better off getting rid of the Washington idiots who can't use a PC, let alone understand technology and its implications?

*Spence Giacalone*
*Senior consultant*
*Compaq Services*
*New York*

Teletoons



# Is it really "morning coffee" if you're having it at two in the morning?

Interesting how the perception of the work "day" has changed, particularly for the communications professional. In this age when the term "morning commute" can refer as easily to the trip home *from* work as the trip to work, and the midnight snack is often pulled from the office refrigerator, one thing is certain: you need a partner that works the same schedule you do.

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For companies connecting with Japan, Asia and Europe, NTT America is always there to help, no matter which language you speak, or time zone you follow. So no matter how late you work, you're never really alone.

Something to think about over your next 1 a.m. "dinner."

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# BUYER'S GUIDE

AUTHENTICATION

# We know who you are

*Different approaches to network authentication give you plenty of ways to prove yourself, but The National Registry's SAF/nt tops our test thanks to tight ties with Windows NT.*

COURT PATTON

If you break into a cold sweat when users tape passwords to their monitors or insist on using easily guessed passwords, maybe it's time to consider a more advanced authentication system.

Tokens, smart cards and biometrics all provide strong security without undue inconvenience, and plenty of options are available.

We brought four authentication packages into the lab to test them. The National Registry, Inc.'s (NRI) Secure Authentication Facility for NT (SAF/nt) won our World Class Award for its seamless integration with Windows NT and support for multiple kinds of biometric authentication. You'll find the full test results in the Review below.

Our Issues and Trends story on page 39 outlines some of the pros and cons of tokens, smart cards and biometric authentication schemes, including hardware requirements, network interoperability issues and encryption support.

When you're ready to evaluate products, go to our Interactive Buyer's Guide Chart on Network World Fusion (www.nwfusion.com) for the full specifications of more than two dozen products. You can download the complete chart or use it online to find products that meet your criteria.

*By John C.C. Dukstа*

## REVIEW

When it comes to passwords, users are lazy. Most will use a word that can be found in a dictionary or a spouse's name, either of which can be guessed or hacked with minimal effort. You can force people to use stronger passwords, but often they'll just write them down on Post-it Notes and stick them to their monitors. And even obscure, reusable passwords are subject to eavesdropping and shoulder surfing.

For strong security, you need strong authentication. This Buyer's Guide looks at two kinds of strong authentication methods: biometrics and token-based hardware. Biometric products employ a personal characteristic of a user — such as a fingerprint, face or voice — to determine that the person is who he says he is. Token-based products use a physical token (usually a credit card-size device) to verify identity, in much the same way that automated teller machines require a bank card and a personal identification number.

There are a number of strong authentication products on the market, each filling a certain niche. To level the playing field for this review, we tested products that bring strong authentication to the Windows NT domain logon. These products replace Windows NT Graphical Identification and Authentication (GINA), the component of the network client that handles user logons. All the products we reviewed encrypt communications between the client and the server, so none would be subject to sniffer attacks.

For integration with Windows NT, we found NRI's SAF/nt to be the best. The company has put a lot of effort into integrating its tools with the standard NT domain utilities. Those features, in combination with support for multiple biometric authentication methods, earn SAF/nt our World Class Award.

**SAF/nt: Don't worry, be HA-API**

With NRI's SAF/nt, you're not limited to a single type of biometric authentication. The company has incorporated the Human Authen-

tication API (HA-API) into its products to allow you to use any qualified Biometric Service Provider (BSP) in conjunction with SAF/nt. NRI has qualified fingerprint, voice and face BSPs for use with SAF/nt.

For the purpose of this review, we tested the SpeakerKey voice verification BSP from ITT Industries. The technology used in SpeakerKey was originally developed by ITT Industries for the National Security Agency for use in computer access control applications. SpeakerKey uses speaker-independent digit recognition in the form of pseudo-random number doublets (for example, "64-79," spoken as "sixty-four, seventy-nine") for authentication. During the enrollment process, users are prompted to say twelve doublets. During authentication, users are prompted to say two.

SAF/nt's most impressive feature is its level of integration with Windows NT. Of all the products reviewed, it is by far the best in this category.

The SAF/nt administration utilities are seamlessly integrated into the standard NT user and server managers. This eliminates the need for the system administrator to enter duplicate data. When you add a user to a domain, you merely have to click the "Biometric" button to configure the user's biometric settings and enroll them (See Figure 1). The program also adds a check box in the server settings (under NT's Server Manager) to set the workstation or server as biometrically enabled.

Client use is equally intuitive. The NRI logon GINA prompts for a user's name and domain. If users are configured for biometric authentication, they are prompted to say the two numeric doublets to authenticate themselves; otherwise they are prompted to enter their regular NT domain passwords. If a workstation is not configured for biometrics, biometric users can enter their user names, domains and passwords as usual.

The SAF/nt server installation went smoothly. SAF/nt requires SQL Server to handle the database of biometric information. The only thing we found confusing was that the manual instructs you to install the BSPs you are planning to use before installing the SAF/nt server package. At first we were a bit worried about getting locked out of the primary domain controller (PDC), but NRI's support folks assured us that wouldn't happen. Installing the BSPs in advance keeps the SAF/nt server installer from complaining that it didn't find any. If you plan to use multiple BSPs, you should install them all before proceeding to install the server package.

NetworkWorld World Class

**Product: Secure Authentication Facility for NT**

**Vendor: The National Registry**

*Tight integration with Windows NT, in combination with support for multiple biometric authentication methods, earns SAF/nt our World Class Award.*

The client installation came off without a hitch. However, if you should ever need to remove a client, SAF/nt and all the other products we reviewed uninstall nicely and return the machine to the standard NT domain logon GINA.

For a primarily NT shop that wants to go with biometric authentication, SAF/nt provides a level of integration with NT far above any other product reviewed here. If most of the machines in your company have sound cards, as do most sold in the past couple of years, SAF/nt's voice authentication can be an inexpensive biometric option.

### Mytec's Touchstone: Fingerprint recognition

Mytec Technologies' Biometric Logon for Windows NT is a software add-on that replaces the standard NT logon with biometric verification using the company's Touchstone fingerprint reader. Touchstone uses Mytec's BioScrypt technology, which takes the image of a fingerprint and cryptographically combines it with a key to create a unique identifier, called a BioScrypt. From BioScrypt, the fingerprint image cannot be reverse-engineered. Mytec's product includes fingerprint-reader hardware and software and Mytec's Biometric Logon for Windows NT application.

Enrolling a user through the BioScrypt Manager software on the client is straightforward. A user must enter a user name, password and domain. He is then prompted to leave four fingerprint images in the Touchstone unit. For an additional measure of security, you can make users enroll while they are logged on under a domain administrator's account.

Mytec uses a sliding technique to simplify image capture. Instead of having a user try to properly center his fingers every time, he slides a finger across a glass screen, and the Touchstone unit captures the image when it is properly centered. It takes about a dozen practice runs to get the slide technique down pat.

Day-to-day use of Touchstone is easy. To log on to your workstation, you enter your user name and press Enter. You are then prompted to slide your finger across the Touchstone reader. The Mytec GINA loads your BioScrypt into the Touchstone. All the comparison work is done in the processor of the Touchstone unit in about half a second, making for a super-fast logon process.

From a security standpoint, Touchstone is terrific. You can configure the GINA to only allow biometric logons if you are protecting a certain workstation. You also can configure the GINA to require biometric logons for enrolled users and allow password logons for unenrolled users. The product writes to the standard NT security logs, so if you've already set up an audit process, nothing has to change.

Installation couldn't be easier; it takes only three diskettes. At the PDC, we selected the BioScrypt server option, which creates a shared directory for BioScrypts. By default, the BioScrypts' shared directory is set to be world-readable and world-writable. To tighten security,

**Figure 1: SAF/nt** *integrates seamlessly with Windows NT. A button on the NT User Properties screen lets you specify which biometric security scheme to use and whether to force biometric logon.*

## Net Results

### SAF/nt 2.0
*The National Registry*
*(813) 636-0099*
*www.saflink.com*
*Pricing starts at $149 per workstation for SAF/nt client (includes Finger BSP)*
*Additional $39 per workstation for ITT SpeakerKey BSP*

**PROS**
- ▲ Best integration with Windows NT
- ▲ No additional hardware needed if your PC has a sound card

**CONS**
- ▼ Using any other biometric technology requires additional hardware expense

### Touchstone 1.0
*Mytec Technologies*
*(416) 467-3330*
*www.mytec.com*
*Pricing starts at $750 per workstation*

**PROS**
- ▲ Fast and reliable authentication

**CONS**
- ▼ Expensive

### TrueFace Network 2.0
*Miros*
*(781) 235-0330*
*www.miros.com*
*Pricing starts at $99 per workstation*

**PROS**
- ▲ Integrates well with NT

**CONS**
- ▼ Very sensitive to changes in lighting
- ▼ Additional expense for video capture hardware

### ACE/Server with SecurID
*Security Dynamics Technologies*
*(800) 732-8743*
*www.securid.com*
*Pricing starts at $3,950 for a 25-user license. Also must purchase tokens at $62 each*

**PROS**
- ▲ Excellent multiplatform solution

**CONS**
- ▼ Not very well integrated with NT
- ▼ Expensive
- ▼ Tokens cost extra

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we recommend you give write access to domain administrators only. You must leave it world-readable so the Biometric Logon client can access the shared directory before the user is logged on.

The workstation install was as easy as it was on the server side. The installation procedure installs a service that communicates with the Touchstone device and the Mytec GINA.

The only real drawback with Touchstone is the high price. At $750 per workstation, the expense of this high-quality biometric product may prove prohibitive.

### Miros' TrueFace: Observe caution

If capturing fingerprints seems a little too much like law enforcement, you can also look authentication in the face. Face-recognition products use a digital camera to validate the user in front of the screen. However, the face-recognition product we tested, TrueFace Network 2.0 from Miros, could be a hassle to deploy in a large corporate environment. TrueFace has a kludgy user interface and requires a lot of administrative effort to maintain.

Security-wise, our main objection to TrueFace is its use of thresholds in the recognition process. For each user, you can set a threshold ranging from zero to 10 to specify how close a match you want the product's neural network face-recognition engine to make. You also set a default threshold for all new users. With the extra administrative process of adding images to the database to compensate for different lighting conditions and false negatives, we can easily imagine administrators tweaking the threshold downward over time to compensate for the additional work.

User enrollment is simple, though it must be performed at a workstation logged on as a domain administrator or else the enrollment application shuts down access to the video-capture device. The application captures at least a couple of pictures of users by having them center their faces in the capture window and click in the image window. Miros recommends keeping about a dozen images of each user on the server, each with different lighting.

The more images available to the neural network engine that performs the face recognition, the less chance it will toss out false negatives, which means it failed to recognize an authorized user.

From an end-user perspective, TrueFace is reasonably easy to use, but not very intuitive. To log on to a workstation, users need to enter their user names and domain passwords, then press Enter. A video-capture window pops up, first in the top left corner of the screen and then in the top right corner. There's no "OK" or "Capture Image" button on the window as you might expect; users must figure out that they need to click in the capture window to tell the application to take their pictures. There are buttons on the window to adjust the color settings, but they seem to work only sporadically.

If a user fails to authenticate on the first try, a message box pops up to tell the user he has three more attempts. If the user fails all attempts, his account is locked out and must be unlocked by an administrator.

Authentication time can be an issue if you don't have a really beefy server on the back end. All the image processing and comparison happens at the TrueFace server. Miros recommends a 200-MHz Pentium Pro with 96M bytes of memory as a minimum. With the recommended server configuration, authentication time should be between five and 15 seconds — not bad, but not as fast as Mytec's Biometric Logon for Windows NT. On our underpowered 133-MHz Pentium, True-Face authentication took as long as 60 seconds.

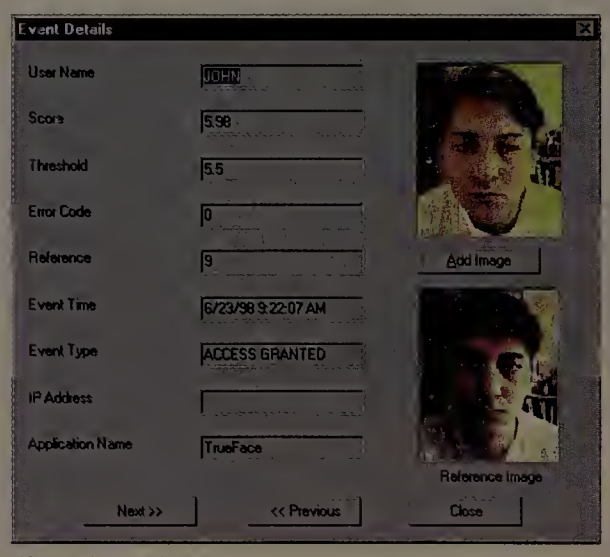


**Figure 2: TrueFace's** *administration program lets you examine events in an authentication log and shows the face associated with each event.*

The TrueFace Server Administrator program requires that you authenticate your own face to get into the package. (Don't worry, there's a default administrative user you can use for initial setup.) Once authenticated, you can add, delete and edit user records, examine the authentication logs, including the images captured (see Figure 2), and add images to a user's profile.

Fortunately, in Version 2.0, TrueFace can pull user data out of the NT Security Accounts Manager, saving you from having to reenter data you already entered when you added users to the NT domain. You'll still be adding a lot of images to user profiles while you deploy the product; until you get the right mix of images for the neural net, you'll probably have many false negatives to deal with and many frustrated users.

The biggest factor contributing to false negatives from TrueFace is lighting. It's best to have a few images from each possible lighting condition. For an office under constant artificial lighting, this shouldn't be a problem. But for an office with a window, it takes some work to get the range of images just right.

We had the opportunity to test the effect a change in hair color has on TrueFace. One of our testers lightened his hair from medium brown to light blond during the testing, and TrueFace handled it just fine, showing that the product does focus solely on the facial features.

TrueFace's server installation went fairly smoothly. It requires that Microsoft SQL Server 6.5 be installed somewhere on your network (not necessarily on the PDC).

While the initial server software install was fairly uneventful, we stumbled over the SQL Server Open Database Connectivity driver; it was unable to change the default database. However, Miros has clearly noted the workaround in the installation instructions. After you get the TrueFace server installed, you have to run a couple of SQL queries to set up its database in SQL Server.

### ACE/Server with SecurID: An ACE in the hole

SecurID by Security Dynamics Technologies is a token-based authentication product; its server-side software component is ACE/Server. In order to log on to a system protected by SecurID, you must enter a passcode from a credit card-size token in place of a normal password. The token has an LCD display that produces a new passcode every 60 seconds, whether or not the user needs it.

SecurID was originally designed to provide two-factor authentication for remote network access. Security Dynamics has since expanded the SecurID product line to provide two-factor authentication on Windows NT, Novell's NetWare, Netscape's server products, Microsoft Internet Information Server and all major Unix platforms.

We like SecurID for a large multiplatform environment, especially considering that it supports Remote Authentication Dial-In User Service for authenticating dial-up users. Security Dynamics provides a facility for importing user data, so if you can export it out of your NT domain, you can save yourself the extra work. If you can't, you'll end up entering user data twice.

The ACE/Agent client is easy to use. If users are members of a group that requires authentication, they are prompted to enter SecurID passcodes when logging on to domain workstations.

Security Dynamics has done a decent job of

## Score Card

| | SAF/nt | Touchstone | TrueFace Network | ACE/Server with SecurID |
|---|---|---|---|---|
| NT integration (40%) | 10 x .40 = 4.00 | 7 x .40 = 2.80 | 8 x .40 = 3.20 | 5 x .40 = 2.00 |
| Client ease of use (20%) | 9 x .20 = 1.80 | 9 x .20 = 1.80 | 5 x .20 = 1.00 | 7 x .20 = 1.40 |
| Time to authenticate (10%) | 8 x .10 = 0.80 | 10 x .10 = 1.00 | 7 x .10 = 0.70 | 8 x .10 = 0.80 |
| Server installation (10%) | 8 x .10 = 0.80 | 9 x .10 = 0.90 | 7 x .10 = 0.70 | 7 x .10 = 0.70 |
| Client installation (10%) | 9 x .10 = 0.90 | 9 x .10 = 0.90 | 7 x .10 = 0.70 | 8 x .10 = 0.80 |
| Documentation (10%) | 9 x .10 = 0.90 | 9 x .10 = 0.90 | 3 x .10 = 0.30 | 9 x .10 = 0.90 |
| Total score | 9.20 | 8.30 | 6.60 | 6.60 |

**Individual category scores** are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

porting its traditionally Unix-based ACE/Server to Windows NT, but the administration graphical user interface (GUI) contains a lot of fields that are inappropriate in a purely Windows shop. There is a field for a default shell, for example, which makes sense in a Unix environment but is meaningless to Windows. However, if you are managing a multiplatform environment, keeping all the information in a single server database could save you some hassle and secure all your computing and network resources. The server database runs on a Progress Software RDBMS32 run-time engine, and the administration GUI is a Progress 4GL application.

You definitely want to read the manual carefully before you start installing the product, including the booklet-size deployment guide. Two things to note: You need to install the server software onto an NT File System partition, and you should sync your server's clock to a Stratum 1 or 2 time server before installation. Stratum 1 time servers get their time directly from atomic clocks; Stratum 2 time servers get their time from Stratum 1 time servers. SecurID cards and their ACE/Servers must be time-synced so their tokens agree.

The server installation process creates four NT groups specifically for SecurID, two for remote logon (via Microsoft's Remote Access) and two for console logon. If you assign a user to one of these groups, the ACE/Agent will prompt for a passcode during logon. Unfortunately, you cannot designate existing groups that must be authenticated in place of one of the four SecurID groups.

Client installation is simple. You install the client and copy a configuration file from your ACE/Server to the workstation.

Each product has its strengths and weaknesses, but for overall integration with Windows NT, NRI's SAF/nt wins hands down. NRI has done an excellent job of bringing strong authentication directly into the standard NT domain utilities. SAF/nt also has the advantage of being able to provide multiple types of biometric logons, something none of the other products has done.

### *How we did it*

We installed the server component of each product on a 133-MHz Pentium with 80M bytes of memory running Windows NT Server 4.0 with Service Pack 3. Our test client was a 266-MHz Pentium II with 64M bytes of memory. We tested each biometric product for false positive and negative results, and evaluated all the products' installation, end-user interface and administrative overhead.

*Duksta is a systems engineer at GTE Internetworking in Waltham, Mass. He can be reached at jduksta@techie.com.*

# Identity confirmed

*Token, smart card and biometric authentication schemes are gradually making their way from the movies to the mainstream.*

*By Frederick M. Avolio*

The tall, slim, tuxedo-clad figure moves purposefully. He approaches a console and lays his hand on a flat glass plate that scans the geometry of his hand and checks his fingerprints. "Identity confirmed," a recorded voice says. He enters an elevator and the thin red line of a laser crosses his right eye, scanning the retina. "Identity confirmed," the recorded voice states again. The elevator door opens in front of an abyss. While taking his first step into what appears to be a 100-foot drop, our hero says, "Bond. James Bond," and a metallic walkway flashes into place as the recorded voice says, "Access permitted to Agent 007."

The hidden walkway is a bit much, but this television commercial for Visa and the movie "Tomorrow Never Dies" isn't all that far off in terms of depicting the kinds of biometric authentication mechanisms mainstream businesses are now deploying to ensure no unscrupulous types access their systems and networks.

ISSUES AND TRENDS

Authentication is the process by which users prove they are who they claim to be. For this Buyer's Guide, we're exploring three basic types of authentication products: tokens, smart cards and biometric devices.

If you need an authentication system that works with firewalls and dial-in servers, tokens or smart cards are your best bets. If you want products that lock a PC unless its user is physically sitting in front of it, biometric devices are a good choice. If you want to be able to do both, plus control access to network and application servers, be prepared to compromise or wait.

#### Proving your presence

Tokens have been available for several years. Priced at about $50 to $100 each, the products use cryptography and passwords or personal identification numbers to establish identity. Some of the first tokens include Axent Technologies' Defender Security Server and Defender Hand Held Tokens; Crypto Card's CryptoAdmin 3.0 and Tokens; and Security Dynamics' SecurID.

Smart cards are credit card-size devices that work in much the same way as tokens. The products cost about $100 each and typically come with a smart card reader. Smart cards rated in the online Buyer's Guide chart (www.nwfusion.com) include ActivCard's ActivPack/ActivCard Gold, GemPlus' GemSAFE tokens and V-ONE's SmartGate.

Biometric devices use personal characteristics to verify a user's identity. These characteristics can include face recognition, fingerprint or eye scans, and voice identification. Prices for biometric products range from just under $100 to several hundred dollars per unit, depending on the device type and amount purchased.

Face recognition requires a digital or video camera. Products such as Miros' TrueFace Network and Visionic's FaceIt identify users by having them mug for the camera.

Fingerprint-recognition products include American Biometrics' BioMouse Plus, Biometric Access' SecureTouch 98, Mytec Technologies' Touchstone and NEC's TouchPass.

Although eye recognition is very accurate, few vendors have developed products that use the technology to provide network access. IriScan is expected to release an iris-recognition system for network authentication next year. Eye recognition requires a specialized camera and light.

Voice identification uses a microphone and sound card, both of which come as standard equipment on most PCs. QVoice's Who Is It, T-Netix's VoicEntry II and Vasco Data Security's VACMan/Enterprise Security Suite perform voice recognition.

Although biometric products have been around for several years, affordable mid- and low-end biometric systems are relatively new. The market is in its infancy, but more vendors are releasing biometric authentication products and usability is improving, says David Harper, program manager of the International Computer Security Association's (ICSA) Biometric Consortium in Carlisle, Pa. The chief benefit of biometric authentication is the technology's convenience for users. For ironclad security, look for a product that links biometrics with another authentication method. For example, American Biometrics' BioMouse Plus fingerprint scanner can be used in conjunction with a password system.

#### Integration is essential

One of the most important considerations when choosing an authentication product is integration. The lack of standard APIs means authentication products often will work with one network operating system or firewall but not another.

Tokens typically integrate with more products than biometric devices because the cryptographic products got a head start in the market. However, numerous biometric API standards efforts are in the works, including Biometrics Application Program Interface, Human Authentication API and Speaker Verification API.

Be patient — widespread integration of strong authentication devices with computer and network systems will happen in a few years. Consumer demand for the products should help spur this process, as will certification and testing programs in organizations such as the Biometric Consortium and the ICSA.

As you evaluate authentication products, remember that one size doesn't fit all. Tokens or smart cards might suit the road warriors in your company who need to authenticate themselves from hotels using notebook PCs, whereas face recognition and the accompanying video cameras might be perfect for desktop users.

Check to see if intruders can thwart the authentication device by rebooting the PC or copying a datastream from a fingerprint reader to a server and later replaying it.

The tokens listed in the online chart will give you little cause for concern — all use strong cryptographic methods and very random numbers to make a replay attack practically impossible.

However, biometric authentication is somewhat less secure. Biometric products must use Data Encryption Standard or Triple DES between the device and the server to protect against intrusion.

By asking the right questions and combining different authentication techniques, you can obtain network security that's easy for users to operate and difficult for potential intruders to thwart.

*Avolio is an independent security consultant in Lisbon, Md. He can be reached at fred@avolio.com.*


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Don't miss our downloadable Buyer's Guide chart of authentication packages on Network World Fusion (www.nwfusion.com). You'll also find an interactive questionnaire that helps you choose an authentication package based on the criteria you deem most important.

In addition to products we tested from NRI, Mytec, Miros and Security Dynamics, the chart includes:

- **ActivPack with ActivCard Gold from ActivCard.**
- **BioMouse Plus from American Biometric.**
- **Defender Security Server and Defender Hand Held Tokens from AXENT Technologies.**
- **SecureTouch 98 from Biometric Access.**
- **CRYPTOAdmin 3.0 and Tokens from CRYPTOCard.**
- **PrivateSafe with PrivateCard and CryptoKit from Cylink.**
- **BIO-2 ScreenSaver from Design and Education.**
- **U. are U. Fingerprint Recognition System from Digital Persona.**
- **GemSAFE from Gemplus.**
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- **SACcat from SAC Technologies.**
- **SafeWord/SafeWord Platinum from Secure Computing.**
- **VoiceEntry II from T-Netix.**
- **VACMan/Enterprise Security Suite from VASCO Data Security.**
- **FaceIt from Visionics.**
- **SmartGate from V-One.**

In addition, you'll find:

- **Research from The Biometrics Consortium.**
- **The ICSA's tutorial on biometrics.**
- **Resources on face recognition and fingerprint identification.**

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# Management Strategies

# Team intranet

*IT managers say building a diverse, harmonious construction team is the first step toward a rock-solid intranet.*

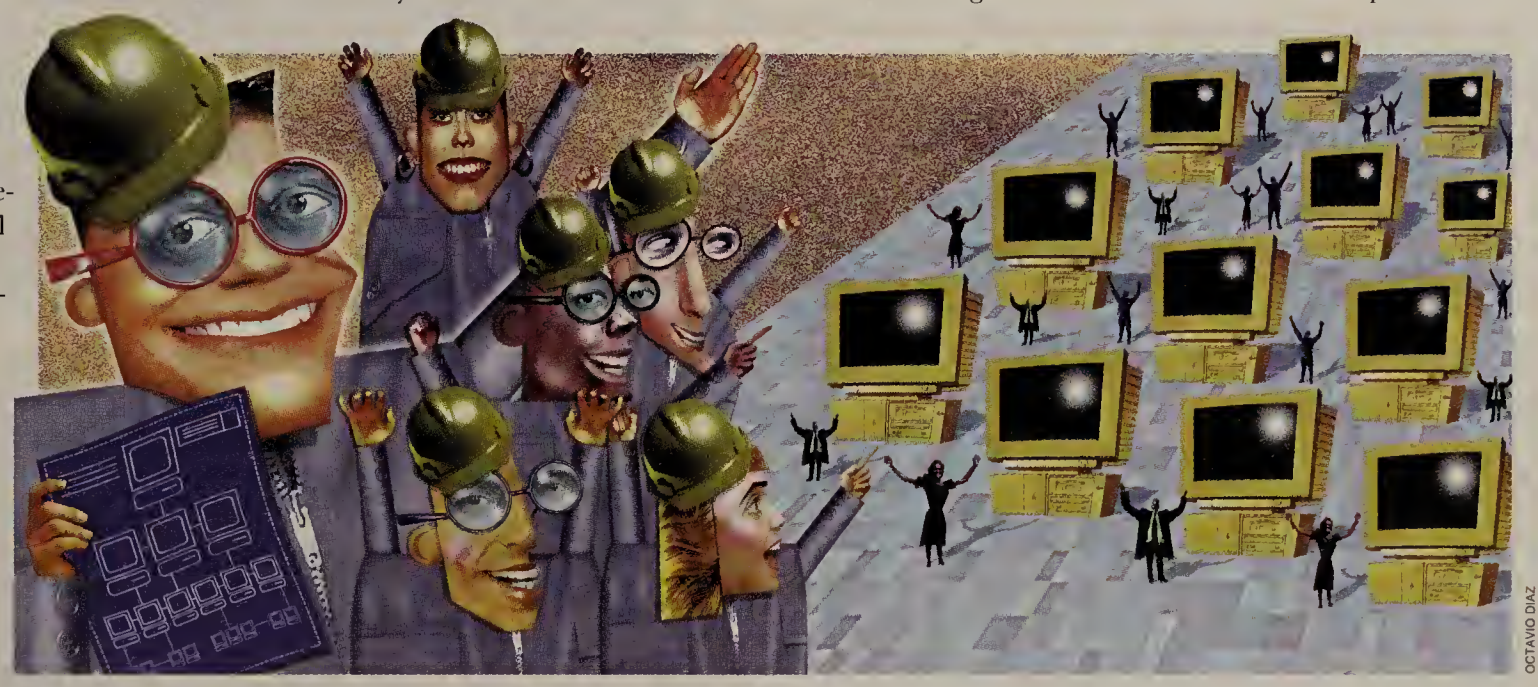
**By Peggy Watt**

Building an intranet is somewhat like founding a town. The population is ready and probably helping frame some of the structures. But becoming a community is the real challenge — and the builders must become a team first to lead the way.

Assembling an intranet construction crew often is trickier than picking a team for traditional IT projects. That's because intranet team members usually are much more diverse than IT staff alone.

On intranet teams, users aren't confined to their usual role of interface design and usability testing. They are often intranet content managers, so they may help with application design and maintenance. Increasingly, a nontechnical person participates to describe business tasks that intranet applications are supposed to solve.

Indeed, the most successful intranets result from pairing technological solutions with business and information management issues, and planning the process with representatives of both, says David Foote, managing partner at Cromwell Foote Partners, LLC, a management consultancy in Stamford, Conn.



OCTAVIO DIAZ

Melding those disparate talents into a team is challenging, but variety is a strength, according to some who've been there. "The first [application] idea often comes from the businessperson, whom I put with the technologists to make it happen," says Sherman Woo, director of Global Village information tools at US WEST in Denver. He considers the intranet team's mission a business strategy, not strictly the accomplishment of technical tasks.

Lofty ideals and all, some nuts-and-bolts suggestions help such construction crews. For example, Foote recommends goals and rewards — especially milestone rewards during a long project. He also encourages rewards, particularly bonuses, for project completion; such perks keep the staff around for the duration.

If you offer incentive bonuses for projects, you've got to spell out the expected milestones and set practices for fulfilling the goals, Foote cautions.

MORE ONLINE

• More resources on team building.

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Woo goes further, protecting a project's momentum from staff departures by rotating the programmers. "One Global Village work ethic is that nobody owns applications," Woo says. "I move people around applications and projects, weekly or even more often."

Consequently, coders are diligent about making program notes. "People are starting to realize I'm serious about this team-building business," Woo says.

Foote also endorses nonmonetary rewards, which he divides into categories. There are the "showy" ones, such as naming an employee of the month or gifts of jewelry emblazoned with the company logo. Others are "pampering," such as tickets to sports events, gift certificates or travel vouchers. Foote's third category is most tangible, what he calls "useful" rewards such as time off, stock, a plum assignment or the opportunity to telecommute or take special training.

Development teams at Solectron in Milpitas, Calif., have been rewarded by going en masse to courses by Microsoft. The benefits are threefold, says Ken Ouchi, the company's chief information officer. Team members feel they are on the leading edge, the training promotes team synchronization and the off-site trip encourages bonding.

Programmers are solitary types who should be reminded that intranet-building is a team project, Woo says. "The big things can't be done by one person, no matter how big the machine," he adds.

One of Woo's tricks is to shun cubicles in favor of clustering workers at shared large tables, at which they are more likely to brainstorm. Woo finds the seating arrangement promotes energy and collaboration.

Similarly, avoid hierarchy, suggests Tom Herring, senior vice president and general manager of NuMega, a division of Compuware in Nashua, N.H. "Empower team members of all experience levels," he advises.

Although forming and growing a team is an ongoing process, sometimes a team can spring forth full-grown, Foote says. He recalls an IT manager who hired an entire development team from a company going out of business. The new employer got the entire construction crew and then introduced them to the business strategists in the new neighborhood. They teamed up to design and build the next expansion to their new town.

*Watt is a senior editor with* Network World*'s* Intranet Magazine. *She can be reached at pwatt@nww.com.*

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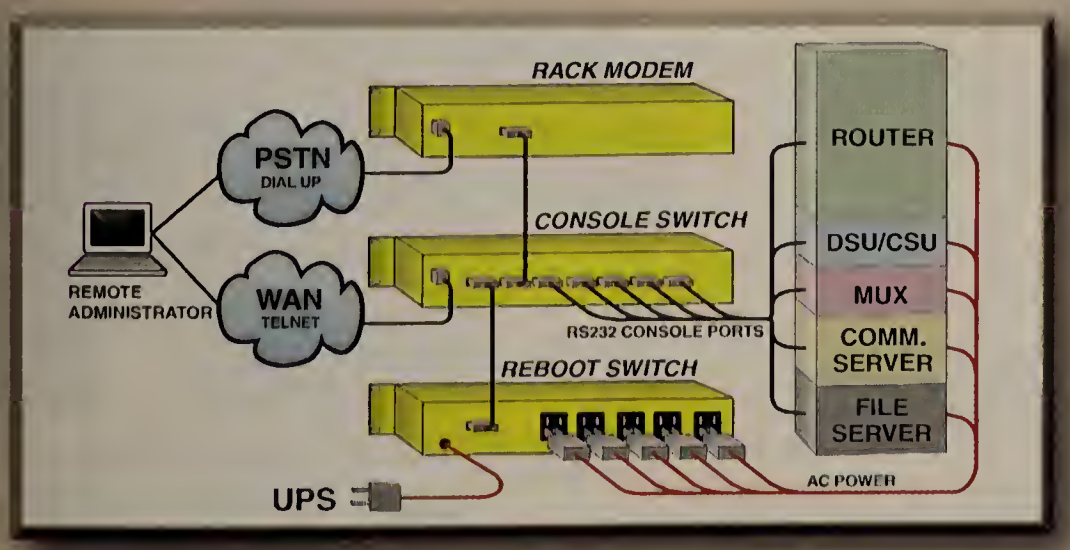


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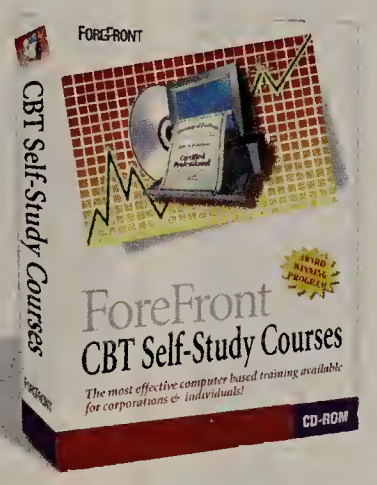


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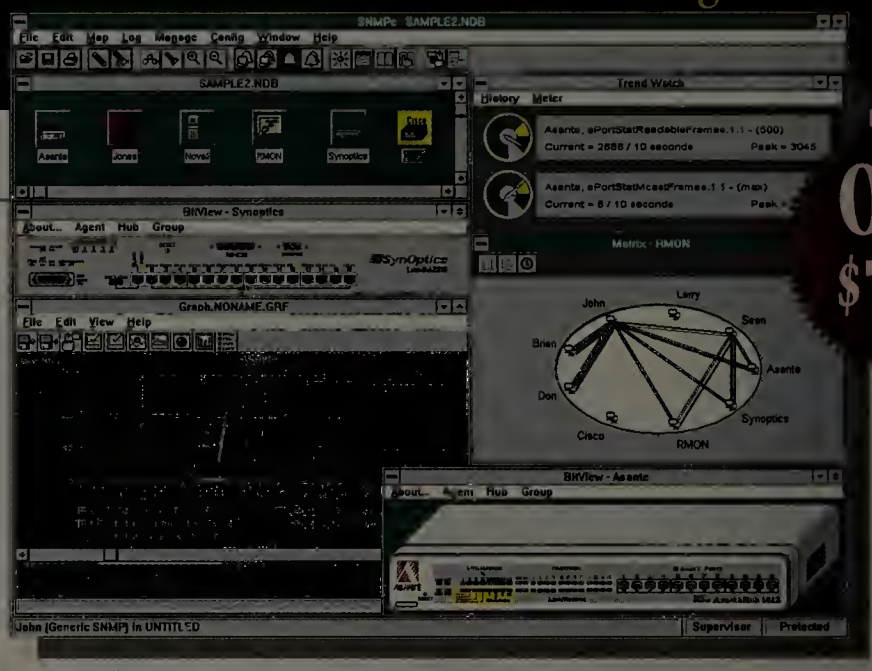


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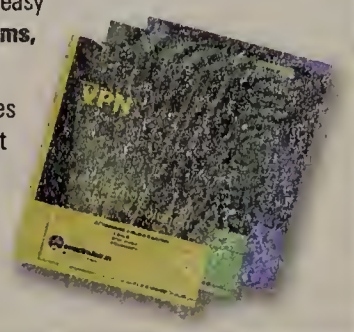


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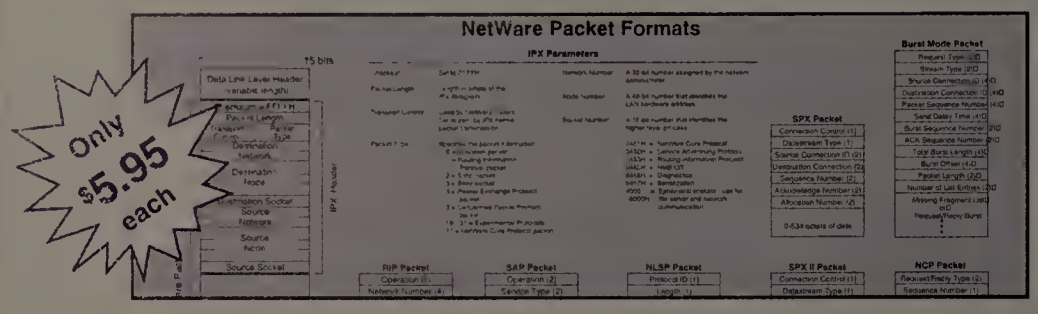


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## EDITORIAL INDEX


@Work ..... 25

**A**

Allied Telesyn ..... 17

**B**

Bright Tiger ..... 8

**C**

Cabletron ..... 8
Cisco ..... 1,8,21
Compaq ..... 1
Concentric Network ..... 10

**E**

Entrust Technologies ..... 54
Epoch Internet ..... 10

**G**

GTE Internetworking ..... 10,25

**I**

IBM ..... 1,21

**M**

Madge ..... 1
Microsoft ..... 17,19
Miros ..... 36
Mytec Technologies ..... 36

**N**

National Registry, The ..... 36
Netscape ..... 27
Novell ..... 17

**O**

Olicom ..... 1

**R**

Rhythms ..... 25

**S**

Savvis Communications ..... 10
SBC Communications ..... 8
Schlumberger ..... 27
Security Dynamics Technologies ..... 36
SoftArc ..... 16
Sun ..... 54

**U**

US WEST ..... 25

**W**

WorldCom ..... 10


## ADVERTISER INDEX


| Advertiser | Reader Service# | Page# | URL |
|---|---|---|---|
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## IPSec

*Continued from page 1*

buy now or wait for companies to propose new, improved "IPSecond" features.

IPSec defines encryption, authentication and key management routines for ensuring the privacy, integrity and authenticity of data as it traverses public IP networks.

At its core, IPSec is intended to let users identify each other over a network by swapping X.509 digital certificates — or some shared secret — in order to set up an encrypted IP tunnel.

"There are things we need to change, and some will be easy and some will be hard," says Bob Moskowitz, co-chair of the IETF IP Security Work Group. "Vendors are going to have to make changes to their existing equipment."

According to Moskowitz, one of the items the working group will look to accomplish is the addition of a new cryptographic algorithm to IPSec. At the meeting, IBM will propose adding a new authentication algorithm for faster data processing in the Internet Key Exchange (IKE). IKE supports RSA and the government's Digital Signature Standard.

Achieving faster processing becomes important when a gateway has to handle 1,000 connections at a time. The auto industry expects to see that level of traffic when using IPSec for security in the Automotive Network Exchange (ANX), Moskowitz notes.

The ANX is billed as the world's largest industrywide extranet; it is likely to link thousands of vendors and customers.

The harder IPSec change will be standardizing on an IPSec remote client. The goal of the IETF meeting is to define a client that can support IP address changes automatically, Moskowitz notes.

"If the user is dialing in and the ISP assigns an IP address, the IPSec gateway will need to know how to let randomly assigned addresses within this tunnel," Moskowitz says.

**Moskowitz** *is driving many of the changes.*

The IPSec working group wants to define a way to establish an encrypted session, in which the gateway will be able to assign an IP address to control where the remote user is allowed to go inside the intranet. This will mean having to change how the IPSec server now works.

Unfortunately, the IPSec working group is not in accord with another IETF group, called the IP Mobile working group, on exactly how this should be done. Another difficult item on this week's agenda will be redefining the core IKE protocol. Security experts recently uncovered a flaw related to the improper exposure of information, Moskowitz says.

And IKE, as it now exists, handles time-expiration of session keys in a way that could cause one gateway not to understand another.

In addition, when two IPSec servers fail to establish an encrypted session with each other, they can't exchange details on why the session failed.

The IPSec working group wants to remedy that oversight before the IPSec standard gets too far along.

Without a uniform IKE, there will be no IPSec interoperability unless users are willing to manually exchange keys — an impractical notion. ■

### What's next for IPSec?

**How the IP Security Protocol suite is expected to evolve:**

- An improved IPSec client will use standardized dynamic IP addressing.
- Support for additional cryptographic algorithms, including RIPEM-160, which Europeans want, and a new authentication algorithm from IBM touted as more processing-efficient than RSA or the Digital Signature Algorithm.
- Corrections in the way cryptographic keys are exchanged via the Internet Key Exchange protocol.

## A busy week at the IETF

The Internet Engineering Task Force (IETF) next week will tackle a number of burning issues, including how to boost IP quality of service and Internet security. Specifically:

- The Differentiated Services (Diff-Serv) working group is expected to send its Header Document to the IETF's Internet Engineering Steering Group (IESG) for final ratification. Diff-Serv defines IP classes of service (CoS) using the type of service (ToS) field in the header of an IP packet. The Header Document describes the way the ToS field should be used to ensure backward compatibility with other CoS technologies.
- The Diff-Serv folks also expect to discuss new per-hop-behavior (PHB) settings. PHBs define packets as they travel over the Internet. Two PHBs will be discussed this week: expedited forwarding and assured forwarding. Expedited forwarding will support high-priority, guaranteed IP traffic. Assured forwarding is expected to support both high- and low-priority traffic.
- The Open PGP working group hopes to submit the final draft of Open PGP, a mail- and file-encryption program. This draft essentially is a public domain version of Pretty Good Privacy 5.0. The IESG will decide if Open PGP can move forward as an IETF RFC standard.

*— Denise Pappalardo and Ellen Messmer*

## Compaq

*Continued from page 1*

Johnson, vice president of Compaq's networks and access communications division.

Compaq also has remote access stars in its eyes and plans to develop higher end Windows NT products in this area, Johnson says.

While shy about specifics during an interview with *Network World*, Johnson says Compaq has a chance to surge ahead in QoS, an area related to policy-based network management. They both give designated users or applications better network performance, he says.

"What we have now for management tools is rudimentary. But it's obvious that QoS is going to be an area that grows because it has so much value to our customers. Frankly, I don't see anybody out there who is ahead of us," Johnson says.

With a strong hold on installed servers and desktops, and alliances with software vendors, he sees Compaq in a unique position to establish priority schemes that incorporate QoS across Ethernet. Johnson says Compaq will look at how to carry LAN QoS across the WAN.

Johnson is also developing plans for the future of Compaq's remote access gear. While continuing to push the Compaq Microcom 6000 concentrator, the company will boost its development of servers that exploit Windows NT Remote Access Services (RAS).

The RAS servers will be able to handle more remote users than current low-end Compaq remote access servers, and will rely on high-density 56K bit/sec dial-up digital modem cards bought from modem specialists. The servers could also support multiple T-1 connections, Johnson says.

Carbon Copy, Microcom's software that makes remote access transactions more efficient, will likely be added to the new NT servers, Johnson says.

Compaq will also be looking to add features that support virtual private networks, including firewalls and Internet tunneling. "There are all kinds of things you can build on top of an NT server that we are looking at," Johnson says.

Johnson expects the price of such boxes to come down as prices of processors and modem cards drop and new features such as Layer 2 Tunneling Protocol are added to NT. "The costs have to come down," Johnson says.

He says residential customers, not businesses, will lead the way to establish high-bandwidth digital subscriber line (DSL) technology. The acceptance of DSL will be driven by the consumer version that is being developed under the name of Universal asymmetric DSL (UADSL). Compaq is a key corporate backer of a UADSL standard also backed by Microsoft and the regional Bell operating companies.

When consumer UADSL demand is high, Compaq will look at what gear corporations need to support such broadband remote access networks, Johnson says. That gear could include servers with high-bandwidth interfaces to link corporate sites to the Internet. ■

### B.J. SAYS:

**Compaq Computer's B.J. Johnson speaks out.**

STEVE BORNS

On policy-based management and QoS:
***"What we have for tools now is rudimentary. But it's obvious that QoS is going to be an area that grows because it has so much value to our customers. Frankly, I don't see anybody out there who is ahead of us."***

On Compaq buying Cabletron:
***"It's not accurate that there is any thought of an acquisition or anything like that. There's nothing going on."***

On DSL technology:
***"The real deal around UADSL is getting accepted by the consumer. Once you get the [residential] volume, you can see what you need for the corporate customer."***

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## Cisco

*Continued from page 1*

Catalyst switches. Cisco runs token-ring data through these modules by tagging token-ring frames with its InterSwitch Link (ISL) virtual LAN (VLAN) trunking protocol. ISL runs on Fast Ethernet and Gigabit Ethernet backbones and identifies the VLAN to which particular traffic belongs.

The demonstration was intended to show users how they can gradually migrate from token ring to Ethernet using the latest high-speed technology — Gigabit Ethernet.

"The purpose . . . is to permit the Gigabit token-ring customer to migrate from token ring to Ethernet in an orderly fashion," says John Marsland, a Cisco token-ring product manager. Running token-ring data over Gigabit Ethernet will ostensibly also enable token-ring users to support bandwidth-intensive multimedia applications that can only be run over 1G bit/sec links. And when they migrate to Gigabit Ethernet, they won't have to swap switches.

**Cisco's** *Marsland*

In the demonstration, Cisco ran token-ring frames through a three-port Gigabit Ethernet switch and a two-port Gigabit Ethernet Supervisor III management module on the Catalyst 5500. By tagging token-ring packets with ISL, Cisco can support Ethernet and token-ring frames over Fast Ethernet and Gigabit Ethernet backbones. Cisco can also support multiple, media-independent VLANs over those same backbones, Marsland claims.

ISL tagging does not violate standard token-ring frame sizes of 18,000 bytes, Marsland says, so no special segmentation and reassembly hardware is required. "We do nothing but transport. It doesn't change the size of the token-ring frame at all," he says.

ISL tagging is the same technique Cisco uses to boost token-ring speeds to 100M bit/sec.

But while many vendors, including IBM, Olicom and Madge Networks, are working diligently on 100M bit/sec token-ring products, Cisco may be the first to show 1G bit/sec token-ring gear (see related story, page 1). "No one else is doing it," Marsland says.

That may be because others are working on native, IEEE 802.5-compliant 100M bit/sec and 1G bit/sec token-ring offerings while Cisco is mapping it to Fast and Gigabit Ethernet.

Indeed, Cisco backed out of the High-Speed Token Ring Alliance (HSTRA) earlier this year, citing little to no market demand for the technology (*NW,* April 6, page 1).

Then why pursue Gigabit token ring? To further underscore its strategy of gradually migrating users to Ethernet, Cisco must support token-ring capabilities on the latest Ethernet technology.

"HSTR will lock you in" to token-ring technology, Marsland says. But ISL could lock users into Cisco equipment, others say.

## Olicom

*Continued from page 1*

the conversion. Because part of his job is to maintain a 24-7 database with research information for all of UCLA through the Internet, it wasn't an inviting prospect. "Before I was thinking 'Just upgrade the whole network to Ethernet,' but with the cost of the cards and everything, it's not cost-effective to do that," he says.

When Olicom asked him to beta test its first 100M bit/sec token-ring technology, Chui says he jumped at the chance.

Chui put Olicom's 100M bit/sec token-ring network interface card (NIC) into his NT SQL server and hooked it up to Olicom's HSTR uplink module in its 8600 CrossFire token-ring switch.

While he saw an increase in speed, he says he won't get the full benefits of HSTR until he gets HSTR NICs for the desktop. Those are expected to arrive in the first quarter of 1999, and he plans to deploy them then.

What he is getting right now is the assurance that he can keep his token-ring network for at least a few more years, and he thinks other people will feel the same way.

"HSTR products can help a lot of people that already have the token ring," Chui says. "For now, there's not enough good things to convince me to go to Fast Ethernet."

With Olicom set to ship the industry's first HSTR products next week, users are indeed getting more confident they will be able to hang onto their token-ring networks for a few years — and maybe longer than that.

Olicom's 100M bit/sec server NIC and a two-port 100M bit/sec uplink module for the company's CrossFire 8600 switch will beat IBM and other token-ring vendors to market by two to three months, Olicom estimates. IBM disputes that notion (see sidebar). By the first quarter of 1999, Olicom plans to ship autosensing 4/16/100M bit/sec desktop NICs and 16-port and 32-port HSTR switches.

By getting to market first, Olicom is hoping to pick off other vendors' users who are frustrated with 16M bit/sec token ring but who don't want or can't afford to go to Ethernet.

**BancorpSouth's Soper** *is impressed with the performance of HSTR gear.*

And Olicom is beginning to do just that. The company has been able to win over David Soper, vice president of network services at BancorpSouth, a regional bank in Tupelo, Miss. BancorpSouth also serves as a holding company for Volunteer Bank in Tennessee and has announced acquisitions of several other banks in Alabama.

Soper says his network, which has more than 2,000 nodes and a WAN spanning three states, is about 90% IBM, with about 5% Cabletron and an equal amount of Olicom equipment. Right now, he's beta testing an Olicom 100M bit/sec HSTR server NIC and CrossFire 8600 switch. So far, he says he's impressed.

"We've seen stuff go across, and we've been watching it very closely, and we think we can even hear it," because it's so fast, he jokes. He plans to beta test it until Olicom pries the equipment out of his hands, he says.

If he remains satisfied with the performance, Soper plans to put the HSTR NICs in up to 12 servers, and he'll consider adding 100M bit/sec to the desktop as well.

While he says he's not exactly choked for bandwidth right now, he's moving into a building with multiple floors, and each floor will have its own independent ring.

By segmenting the network with an intelligent hub, he's going to be pushing more bandwidth to his backbone on each floor.

While he's still using IBM Token Ring equipment, he says Olicom's gaining a real edge with pricing and performance on adapters. For example, he says Olicom charges him $10 to $20 less per 16M bit/sec NIC than IBM.

What really made him take a second look at Olicom was that the Olicom cards support a Linux driver, he says. Linux is a home-grown Unix operating system that has gained almost a cult status in the past year; BancorpSouth uses it in workgroups attached to its network.

But the bottom line is this: Will token-ring users still migrate to Ethernet in any significant numbers? Maybe not anytime soon. As Soper puts it, "We are so large and so seeded in token ring — I can't imagine that it would be prudent anytime in the near future."

Olicom's RapidFire 3530 HSTR 100 PCI adapter will list for $350. The CrossFire 8650 HSTR Uplink universal expansion module over copper will list for $1,100, and the CrossFire 8651 HSTR over multimode fiber will list for $1,350. Each module is outfitted with two 100M bit/sec HSTR ports.

✆ Olicom: (972) 907-4600

**Get more information online at www.nwfusion.com DocFinder: 8530**

## IBM High-Speed Token Ring gear not far behind

IBM estimates it owns 50% of the roughly 20 million token-ring nodes in the U.S., according to David Olechovsky, a product line manager for IBM Token Ring products. And the company is not ceding the market to Olicom or any other players just yet.

Olechovsky says IBM plans to ship autosensing High-Speed Token Ring (HSTR) 4/16/100M bit/sec adapters for clients and servers in the next 30 to 60 days. A 100M bit/sec universal feature card for the 8270 Nways LAN Token Ring Switch should be available by year-end or early in 1999.

Sources familiar with the negotiations say IBM is also talking with Xylan about developing HSTR switches, but Olechovsky declined to comment. He would only say he expects IBM to ship HSTR switches later this year.

IBM resells Xylan's OmniSwitch as the 8274 LAN Nways RouteSwitch, with modules for token ring, Ethernet, Fast Ethernet, FDDI and ATM. Xylan expects to ship new 16- and 32-port 16M bit/sec token ring modules that IBM will resell by October. IBM currently sells a six-port module for the switch.

An International Data Corp. survey puts token-ring sales, which includes adapters, hubs and switches, in 1997 at $1.8 billion, which is impressive. That is, until you compare it with Ethernet sales for the same year — almost seven times the amount, at $12.4 billion.

*— Robin Schreier Hohman*

"As far as I know, ISL only talks to other ISL equipment, and that means only Cisco equipment," says David Olechovsky, chairman of the HSTRA and a product line manager for IBM Token Ring products. "We haven't tested ISL, but we would naturally be concerned about the latency introduced by encapsulating token ring in Ethernet frames," he says.

"I've done enough work with Cisco to know they have zero plans of doing either Fast token ring or gigabit token ring," says David Passmore, president of NetReference, a Sterling, Va., consultancy. "This is consistent with their strategy to offer switched token ring at the edge, but the trunking between those switches would all be Ethernet-based."

That hits home with users.

"Our plan is to migrate from token ring to Ethernet; we've already launched that program," says Charles Sokolski, managing director of telecommunications for The Equitable Life insurance company in New York.

"It could offer some enhancements in my installed base of token-ring users. If I can upgrade my ISL backbones to Gigabit and support both my new Ethernet desktops as well as my legacy token ring and get those performance advantages, it's really ideal. I don't know that it prolongs the life of token ring, but it helps me during my migration period," he says.

Cisco is currently taking orders for the Gigabit Ethernet switch modules and uplinks with ISL/token-ring support. ■

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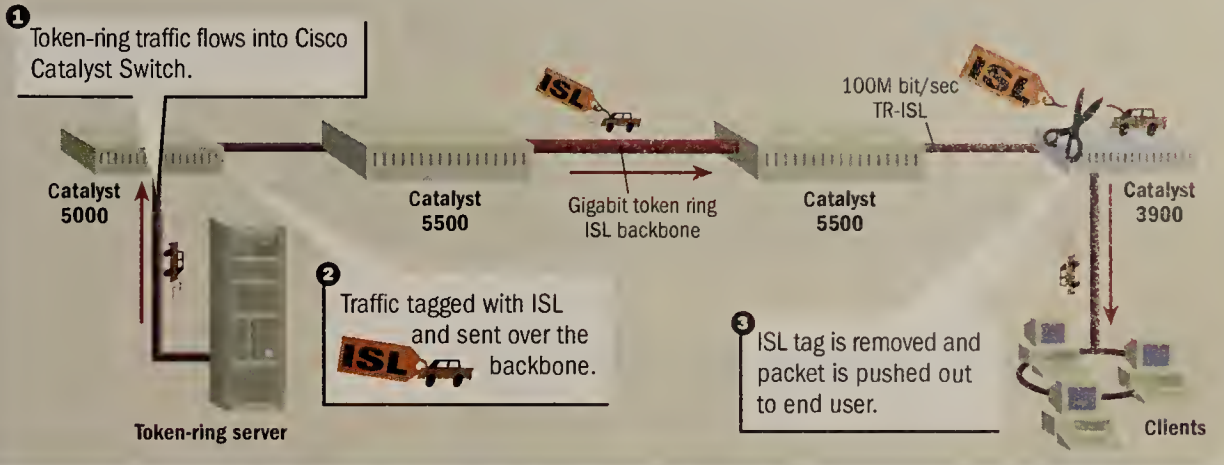
### CISCO'S GIGABIT-TOKEN RING ROAD MAP

Here is the route taken by one token-ring packet using InterSwitch Link (ISL).




## Bug

*Continued from page 1*

accidentally by a Cisco developer.

"I believe it was discovered while we were doing some research into a completely different issue," says Peter Long, director of IOS marketing at Cisco. "We didn't actually have anybody report any particular exploitation of this bug. But it helped explain some of the unexplained crashes reported sporadically."

Cisco discovered the bug weeks before the field notice went out on Aug. 12, Long says.

The error affects most Cisco routers with model numbers greater than or equal to 1000, including the high-end 7000 and 12000 series, which are prevalent in large enterprise and ISP nets. The bug does not affect the 7XX series routers; Catalyst LAN switches; WAN switching products in the IGX or BPX lines; the AXIS shelf; early models of the LightStream 1010 or LightStream 2020 ATM switches; or any host-based software, Cisco says.

If attackers know the details of the Cisco IOS software error they will be able to cause the router to crash and reload without having to log on to the router, according to the field notice. Such exploitation would require significant engineering skill and a thorough knowledge of the internal operation of Cisco IOS software, including Cisco trade-secret information, the notice states.

And it is not necessary to log on to exploit this vulnerability; simply establishing a terminal connection is enough to cause a crash, the notice says.

Those connections include direct console or asynchronous serial connections, including dial-up; telnet; Unix "r" commands; LAT, MOP, X.29 and V.120 connections; and possibly others. Cisco strongly urges network administrators to assume that hostile users can find ways to make interactive connections to the administrators' Cisco IOS devices.

IBM Global Services has 45,000 business customers that depend on IBM for WAN connectivity. Many of those customers are affected by the Cisco bug, according to an IBM Global Services spokesman. "We're still assessing how many routers will need to be upgraded, but it's in the thousands," he says.

Cisco sent a software patch to IBM Global Services last week. The software is being tested in IBM's quality-assurance test lab, so IBM is certain the software patch will not cause any other problems for customers, the spokesman says.

It also connects a dial-up business line used for upgrades and monitoring purposes when IBM deploys routers for its customers, he says. IBM Global Services is instructing customers to disconnect the dial-up connection to eliminate the risk of an attack.

When IBM is ready to send the software patch, the company plans to notify all customers via telephone so they can reconnect their dial-up connection, the spokesman says. IBM Global Services will not start sending patches out until early September, he says.

Yet AT&T Solutions would rather risk attack than fix the bug with software that may be unstable. "The new code that Cisco is offering would raise the possibility of introducing other difficulties into AT&T Solutions' networks," an AT&T spokesman says.

AT&T Solutions manages networks for big business clients such as Clorox, Visa and the Automobile Association of America. In total, AT&T Solutions is managing more than 10,000 Cisco routers that could be affected by the bug, the spokesman says. "We haven't seen anything along the lines of what Cisco has warned about in our own gear or in anything we manage for our clients," the AT&T spokesman says.

The University of Southern California (USC) has not seen any of its Cisco routers mysteriously crash. But the bug is "pretty serious," says James Wiedel, director of networking at USC.

"If that really gets out it could cause a lot of problems," he says. "Our command ports to the router ports are password protected before you even get to them. But you could telnet to them, so it sounds like we're vulnerable."

Though the error is present in IOS 9.1 and later, certain images in the 11.X versions of IOS have been corrected. The first regular 11.0 release containing the fix will be 11.0(21), which is tentatively scheduled for mid-September, Cisco says.

The company is offering free software upgrades to all vulnerable customers, regardless of contract status. But hardware upgrades, if necessary, will be negotiated on a case-by-case basis, Cisco's Long says.

Users can also work around the problem by preventing interactive access to the Cisco IOS device, the company says. Users can apply access lists to all IP virtual terminals and restrict access to non-IP terminals through common configuration and command line routines. ■

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### The remote router crash situation

**Problem:**
Unauthenticated users can crash Cisco routers without logging on.

**Who's affected:**
Any user of Cisco routers, beginning with 1000 series on up and running IOS 9.1 and later versions.

**Impact:**
In addition to crashing a router without logging on, attackers can damage internal data structures to further impair system operation.

**Fix:**
Certain images in the 11.X release cycle have been corrected; the first regular fix will be in 11.0(21), due next month.

**Workaround:**
Configure access control lists for IP terminal access; deny access to non-IP terminals.

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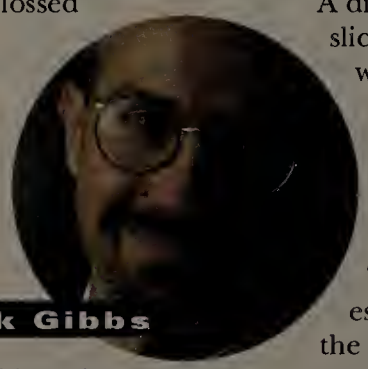
Backspin

# From spam to propagandaware

I had expected to tackle other topics, but I find I need to once again hit the subject of last week's column: bulk e-mail. The reason for revisiting the issue is that I just received spam that creates a whole new subcategory of junk e-mail.

Perhaps I should start by defining my terms. Last week, I glossed over the distinctions between types of spam.



Mark Gibbs

To begin with, there's bulk e-mail that is sent to you because you signed up somewhere. This constitutes solicited bulk e-mail, although the line between solicited and unsolicited is easily crossed by too-frequent postings and content that isn't quite what the recipient expected.

The big boys in the computer industry conduct this kind of e-mail distribution, and we don't mind. We actually want to know what Microsoft, Novell and others are doing.

Someone challenged my assertion last week that Microsoft distributes spam. His point was that if you get something from Microsoft, you must have signed up for it. Well, sure, but asking for one thing shouldn't result in receiving a score of other thinly related items. Moreover, it should be easy to get Microsoft to stop.

Several people wrote me stating they have received what they consider spam from Microsoft. A complaint raised by a couple of readers was that if they reply with a "remove" message, nothing happens. Microsoft isn't the only company with this problem.

I would suggest that any company sending out bulk e-mail — no matter how responsibly it might handle the rest of its operation — becomes a spammer the first time it fails to act on a remove request.

The opposite of solicited e-mail is, of course, unsolicited e-mail. Most spam campaigns use a buckshot approach: load up the e-mail cannon and blast away. But some spammers do attempt to target their messages.

Targeting assumes the recipients can be identified as suitable goals for the message's pitch. In the real world, targeting is a science. A direct mail company might take several lists of five or 10 million names each and analyze them a dozen ways.

A direct mail company will slice and dice lists until it whittles them down to, say, 250,000 names, to whom it expects to have a reasonable chance of selling a product or service. This kind of care is necessary when each item the company sends out costs at least 50 cents or more.

But on the Internet, targeted spam is rare because the costs are minute.

Now in all the above cases, the bulk e-mailer wants to sell you something — get rich quick, visit my site, buy this product and so on. But this new form of spam I received isn't trying to sell you anything. The author doesn't want you to go to any Web site, respond to the message or do anything. That is, anything other than believe him.

This message starts out discussing the good old Year 2000 problem and predicting gloom, doom and a gnashing of teeth. It then goes on to discuss religion — it is actually a dressed up religious tract. The author says that the return address won't work and that no more messages will be sent. This is the digital version of anonymous pamphleteering.

I predict this kind of agenda spreading will become an enormous source of spam and will be much harder to deal with than commercially oriented spam. I haven't found a good name for this stuff yet, but propagandaware, e-prop and e-puff are contenders.

Let me know if you get any of these messages and your suggestions for a name for them.

*Memos to nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504.*

## 'Net Buzz

The latest on the Internet/intranet industry

**HOTSPOT, WE'LL NEVER KNOW YE** It's time for **Sun** to admit the obvious: The long-promised **HotSpot** compiler technology intended to double the speed of Java applications simply doesn't exist.

HotSpot clearly is Sun's little practical joke on the Java community. How else can the by-now ridiculous delays of its release be explained?

Announced in April 1997 as part of a detailed Java roadmap, HotSpot originally was scheduled to be part of the **Java Development Kit (JDK) 1.2** slated for release in the summer of that year.

Several months later, Sun announced that HotSpot's debut would be pushed back to spring 1998. Then it became this fall.

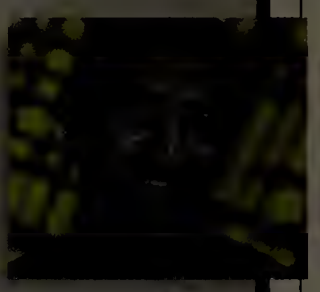
Now we are told that HotSpot won't appear before February 1999.

Of course, JDK 1.2, which is much more significant technology, also has been delayed several times. Last week Sun announced that JDK 1.2's scheduled September ship date has been pushed back to November.

However, at least there have been several beta versions of the next JDK; and some parts, such as the graphical user interface component called Swing, have already been released. So we know a new JDK actually is in the works.

HotSpot is a different story. Supposedly, alpha users have been testing the technology, but try getting the name of one from Sun representatives. It's like the users are in the witness protection program.

Claims from Sun officials that they're delaying HotSpot to make the technology as good as possible ring hollow. What's more likely is they can't get the darned thing to work at all.



Chris Nerney

Sun owes it to Java developers to come clean about HotSpot. If it doesn't, Sun will be guilty of something that it and others accuse **Microsoft** of doing — trying to freeze the market with false promises while Sun scrambles to get its act together.

A prediction: We'll see **Elvis** attending JavaOne before we ever see the mysterious HotSpot.

**IN INTERNET SECURITY STOCKS WE TRUST** That blur you saw last Tuesday was the initial public offering (IPO) of Internet security software start-up **Entrust Technologies, Ltd.,** which blasted off the launch pad to surge almost 60% above the asking price of $16 a share before closing at $20.

The IPO raised $124 million for the company, which spun off from **Nortel** in January 1997.

Driving demand for the stock is fear, always a great motivator. Entrust, based in Richardson, Texas, sells digital certificate technology designed to protect online transactions from unscrupulous hackers.

And you know what they do to hackers down in Texas. That's right: string 'em up, and force them to listen to country music and eat red-hot barbecue sauce. Not particularly high-tech, but effective nonetheless.

The 'Net security market is expected to be huge, and Entrust already is a major vendor of digital certificate technology. Many Wall Street types predict Entrust will be a solid, if unspectacular, stock performer over the long term.

**IS THERE NO ESCAPE?** One of our favorite stock information and discussion sites on the Internet is **Silicon Investor (www.techstocks.com).**

The site is full of detailed information about public companies and is a favorite watering hole of chatty stock investors, speculators, shills and manipulators, some of who are the same people.

Unfortunately, the site seems to have gotten off topic these days. While visiting Silicon Investor's home page last week, I was greeted with the following headline under the "Hot Topics" section: "**Clinton's** Scandals — Is this corruption the worst ever?"

There goes the neighborhood.

*'Net Buzz is offering a reward to anyone who can prove the existence of HotSpot. Send us your evidence, along with any interesting Internet- and intranet-related news. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.*

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